THE PERCEIVED BENEFITS AND BARRIERS TO THE ESTABLISHMENT OF A FOOD HUB IN NOVA SCOTIA, CANADA

by

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Dalhousie University is located in Mi'kma'ki,
the ancestral and unceded territory of the Mi'kmaq.
We are all Treaty people.

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ABSTRACT

In recent years a food distribution business model, known as a food hub has emerged as a potential solution to help support local food economies. Small and mid-sized farm operators who are interested in entering the retail sector, may have trouble doing so due to their lack of sufficient product volume therefore, food hubs have become a popular alternative to traditional wholesale and distribution businesses in order to support small growers. The aim of this research was to understand if a food hub would be a beneficial distribution model for small farmers in Nova Scotia, Canada. Both primary producers (farmers) and representatives from the retail sector (restaurant owners, institutional representatives, etc.) in the province were interviewed using semi-structured interview methods. This data was collected and analyzed using thematic analysis in order to better understand the interview participants' perceived feelings on the potentialbenefits and barriers that may be present surrounding the concept of a food hub for Nova Scotia. The key result of this research is that the potential barriers that would prevent a food hub from being a viable and sustainable business model in Nova Scotia outweigh the potential benefits it could provide for the local food economy.

LIST OF ABBREVIATIONS USED

LFS	Local food system
USDA	United States Department of Agriculture
U.S.	United States
NSFA	Nova Scotia Federation of Agriculture
DTC	Direct to Consumer
FGFN	National Good Food Network
COG	Cost of Goods

ACKNOWLEDGEMENTS

"Eating is an agricultural act. Eating ends the annual drama of the food economy that begins with planting and birth. Most eaters, however, are no longer aware that this is true. They think of food as an agricultural product, perhaps, but they do not think of themselves as participants in agriculture. They think of themselves as 'consumers.'" -Wendell Berry

I would first like to thank my thesis committee members, Peter Tyedmers and Simon Somogyi for their knowledge, expertise and their relentless support of my research. Thank you for believing in me even when I may not have believed in myself.

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Chapter 1

Introduction

1.1 Introduction and Background

In recent years, consumers, policy makers, and farmers alike have expressed increased interest in creating thriving local food systems (Low et al., 2015). This growing interest in local food has been a culmination of multiple movements throughout the United States (U.S.) and Canada (Guptill and Wilkins, 2002). The environmental movement has brought focus to the relocalization of our food system as more research and discourse on our global food system has emerged. Specifically, there has been concern over the negative effects that high-input agricultural practices may have on the environment, including the safety and efficacy of conventional chemical fertilizers, pesticides, and the environmental degradation that these agricultural practices can have on soil and the surrounding ecosystem (Clark and Tilman, 2017; Spiertz, 2009). However, not all claims made by proponents of local, sustainable food systems are true, including the belief that the long-distance transport of food contributes considerably to our global greenhouse gas emissions (GHGs). In reality research finds that transportation accounts for a small portion (11 percent) of lifecycle GHG emissions from conventional agricultural production (Wakeland et al., 2011). There are, however concerns that have been supported by research, an example of which includes the link between the increasing use of fertilizers in conventional agriculture causing more rapid algal growth in nearby bodies of water (Chakraborty et al., 2017).

In tandem with the local food movement, there has also been a growing interest in creating more resilient food systems, dedicated to improving consumer access to safe, healthy, and culturally appropriate food (Stevenson et al., 2011; Woods and Tropp, 2015). The Slow Food movement, for instance, having originated in Italy has emerged in response to the “industrial” practices of the global foodsystem, and encourages more traditional practices of growing and preparing food (Simonetti, 2012). Fundamentally, the local food movement is focused on creating more transparency within the food system by creating direct-to-consumer (DTC) methods of selling (Martinez et al., 2010). This movement has been largely driven by consumer demand, with customers stating that direct forms of purchasing such as farmers markets, feel ‘nostalgic’ or that community supported agriculture (CSA) seems to ‘soften’ the economic transaction between the consumer and producer(Hinrichs, 2000; Smithers et al., 2008). Food scholars have struggled with defining local food as the definition itself is complex, varying with purpose, location, and data availability (Martinez et al., 2010). While some might consider local food to be supporting farmers from their immediate community, others might support farmers in a general region made up of multiple states or provinces. One widely accepted definition was established through the 2008 U.S. Farm Act (H.R.2419 110, 122 Stat. 923) which states that a food item can be marketed as local if it has traveled 400 miles (643 kilometers) or less from the point of production to the point of purchase (Martinez et al., 2010).

With relocalized food supply chains that employ one or more DTC methods of selling, like farmers markets and CSAs, the middlemen involved in the processing, packaging, and overall distribution of food have disappeared (Martinez et al., 2010). In an effort to increase the connection between producers and consumers, the local food system intentionally seeks to cut out the middleman, a process also known as disintermediation (Rosenbloom, 2013). However, the ability for small and mid-sized farms to remain profitable while relying solely on DTC markets can prove difficult.

With continued pressures for the further consolidation of our food system, creating fewer, large-scale competitors throughout the supply chain, small and mid-sized farms are either too large to participate in direct forms of selling, or too small to sell to intermediated channels (i.e. grocery retailers) (Welsh et al., 2008). A 2011 United States Department of Agriculture (USDA) study found that large farms, those with $1 million or more in gross cash farm income (GCFI), accounted for 93 percent of local food sales marketed through intermediated channels, while many small farms stated that they rely exclusively on DTC marketing channels. It has been recognized that small and mid-sized farms often have trouble entering new markets on their own (Feenstra and Hardestry, 2016; Severson and Schmit 2015). The challenges many small to mid-sized farms face when trying to diversify their customer base, has spurred the creation of one option in some settings, a social enterprise concept known as a food hub (Matson and Thayer, 2013). At its core, a food hub is an intermediate step in a local food system that seeks to aggregate food from multiple small and mid-sized producers and distribute the product to various customers and stakeholders within the local food economy (Fischer et al, 2015). Just like the challenge of defining local food, there has yet to be a widely accepted definition of a food hub due to the many business structures that a food hub can adopt. However, despite a more formal definition, the Food Hub Collaboration (2011), a partnership between the Wallace Center, USDA, and the National Good Food Network (NGFN), that seeks to ensure the success of existing and emerging food hubs in the US, has created a definition that aims to encompass the broad range of food hub models that have developed throughout North America. Barham et al. (2012), presents the proposed definition:

> "A regional food hub is a business or organization that actively manages the aggregation, distribution, and marketing of source-identified food products

> primarily from local and regional producers to strengthen their ability to satisfy wholesale, retail, and institutional demand" (pg. 4)

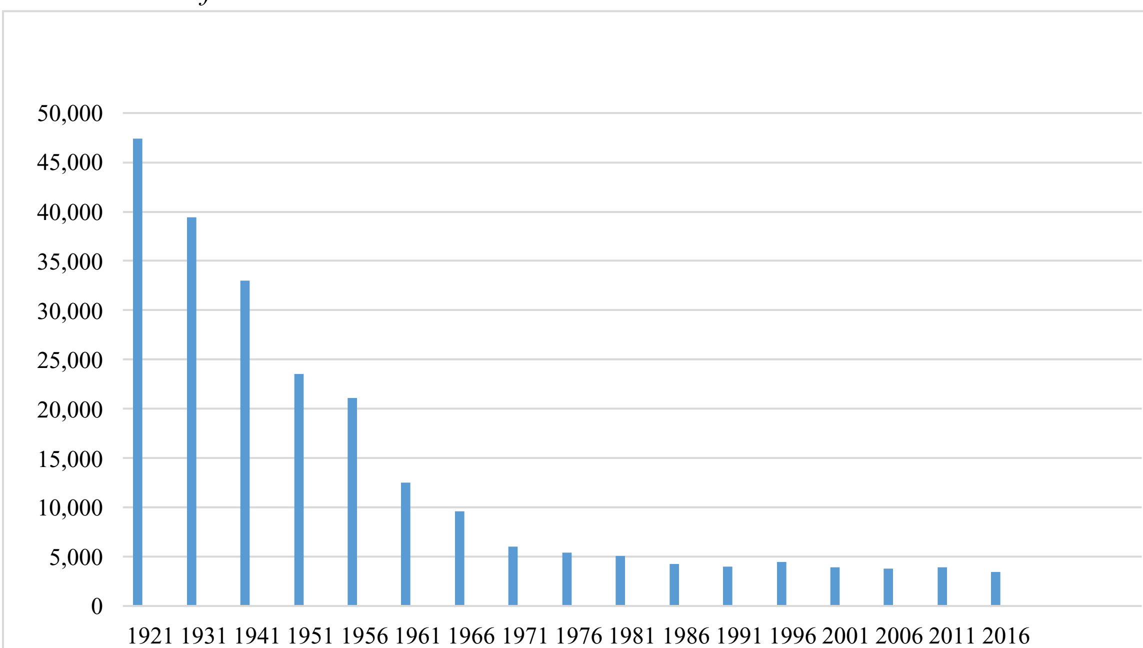
Food hubs can be structured either as a for-profit or non-profit business, and in some cases are cooperatively owned and operated (Barham et al., 2013). In any case, a food hub is a business and therefore has monetary goals. Food hubs often have social goals that fundamentally differentiate them from a traditional wholesaling food business. By definition, wholesalers are a type of intermediary or middleman that sells goods for resale to retail, industrial, commercial, institutional, or agricultural firms (Rosenbloom, 2013). The main difference between a local food distribution business that wholesales and a food hub are the mission-driven initiatives. Food hubs have emerged to aid small and mid-sized farms that wish to scale-up their operation or enter new markets (Fischer et al, 2015). Results from the U.S. National Food Hub Survey found that 92% of food hubs reported that most, if not all of their product was purchased from small and mid-sized farms (Fischer et al., 2016). Many hubs offer additional services that are focused around making an impact in local communities, examples that include but are not limited to: donating excess food, offering technical assistance to producers such as workshops on season extension, and nutrition/cooking classes to the community (Fischer et al., 2013). A food hub's design and function is primarily based on the specific needs of the region it is serving. Therefore, there is no "one sizefits all" food hub model, but rather the business model and "added" services reflect the needs of the community.

1.2 Brief Statement of the Problem

The province of Nova Scotia, situated in Atlantic Canada, has a long history of agriculture. Though the extent of food cultivation by its earliest inhabitants, the Mi'kmaq, is unclear, farming was one of the first activities undertaken by French colonists as they settled what became Nova Scotia in the early 1600's (Butzer, 2002). As early as the late 1800's the province opened the Nova Scotia Agricultural College in Truro, which promoted producer cooperatives and established the Nova Scotia Federation of Agriculture (Bent, 2016). As depicted in Figure 1, as of 1921 Nova Scotia had nearly 47,000 farms, however, in the post-world-war era, that the number has significantly decreased and there have been ongoing efforts to modernize the province's agricultural sector in order to compete in the global market (Homegrown Success, n.d.).

Figure 1

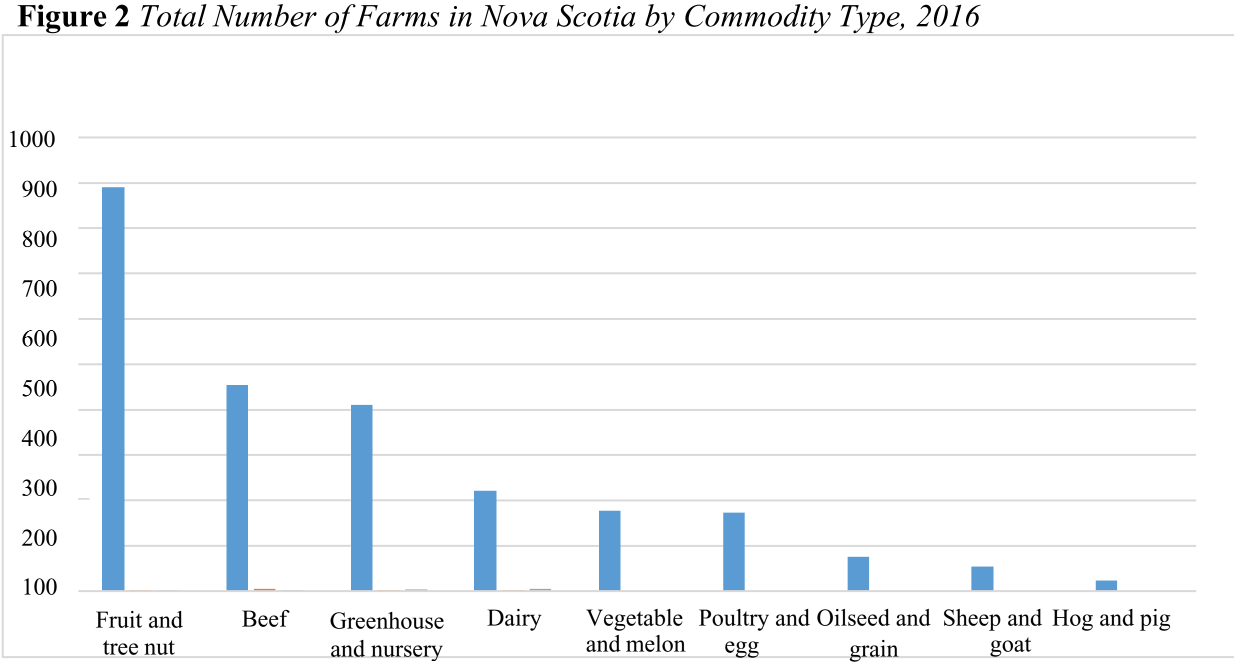
Total Number of Farms in Nova Scotia 1921-2016



Note. Data from Statistics Canada, 2016

Beyond the urban center of Halifax, the province is predominantly rural and at one point in time, most rural communities in Nova Scotia were engaged in some form of agriculture, but this is no longer the case. Throughout the years, shifts in the population and the establishment of other types of industries have brought change to the rural communities of Nova Scotia, and the province has struggled to remain competitive with the rest of Canada, only accounting for 2.3% of the country's economy in 2017 (Statistics Canada, 2018). Much like the rest of North America, farms in Nova Scotia have been affected by the continued consolidation of agriculture. Between the years of 2001 and 2006, the province witnessed the folding of 128 farms, a number that is quite significant considering the small geographic size of the province (Statistics Canada, 2006). However, during that same five-year period the province also saw a 2.2% increase in total farm area (Statistics Canada, 2006). As of 2016, there were 3,478 farms in Nova Scotia, many of which are small and mid-sized farms, and fruits and vegetables accounted for a combined 20% of cropland in Nova Scotia (Statistics Canada, 2016). Small, family owned farms tend to grow a large variety of crops including vegetables and some fruits (Statistics Canada, 2016). The 2016 Census of Agriculture counted the number of farms in Nova Scotia by commodity type as seen in Figure 2, which shows that there were 890 fruit and tree nut farms counted that year.

Figure 2 *Total Number of Farms in Nova Scotia by Commodity Type, 2016*



Note. Data from Statistics Canada, 2016

Given the temperate climate in Nova Scotia, crops including cold hardy varieties like potatoes, carrots, squash and other root vegetables that grow and store well during warmer months (Scott and McCleod, 2010). If the farm has access to a greenhouse, a wider variety of vegetables and summer fruits are often available to consumers earlier in the season (Clement, 2015). Medium to large-scale farms in Nova Scotia tend to focus their efforts on a more limited variety of produce, sometimes only growing one or two types of vegetables, or a fruit that grows and stores well like apples (Jennifer Scott, 2010). In this case, producers are able to grow a large volume of one type of vegetable that can either be exported or distributed to grocery stores in the region (Barham et al., 2012). This method of growing and distribution differs from a small, mixed-vegetable operation where the farm typically grows a wider variety of produce that is then sold directly to consumers through farmers markets or CSAs (Barham et al., 2012).

The Nova Scotia Department of Agriculture (NSDA, 2010) describes agriculture within the province as a "cornerstone industry," in that the use of physical resources that come from both land and sea in order to produce goods, has helped to grow other parts of the economy. For example, the agricultural industry employed 5,800 people in 2010, a number even larger than those employed by the fishing industry in Nova Scotia (NSDA, 2010). That said, 44.4% of farmers in the province still must supplement their income with off-farm work (Statistics Canada, 2016). This may be due, in part to the fact that Nova Scotia, much like the rest of North America, has created a dependency on purchasing from larger farms out-of-province and overseas that use cheaper labor and inputs (Scott and McCleod, 2010). The 2010 report: Opportunities and Challenges in Atlantic Agriculture, warns that there are many "hidden" costs of food imports, many of which affect the vitality of Nova Scotian farms and the rural economy (Scott and McCleod, 2010). Although the priorities of the province's agricultural sector have likely shifted due to COVID-19, prior to the global pandemic, the conversation in Nova Scotia was focused around bringing innovation to the agricultural industry (Homegrown Success, n.d.). Most notably, the development of Perennia Food and Agriculture, an agency owned by the provincial government, focuses on innovation within the food and agricultural sector of the province. "Homegrown Success: A 10 Year Plan for Agriculture" was a plan put forth by the provincial government that expresses the need for substantial innovation in order for Nova Scotia's agricultural sector to succeed and remain competitive with the rest of Canada and the U.S. Most recently, in 2018 the province, in conjunction with the federal government, was awarded the five-year Canadian Agricultural Partnership, which includes a three-billion-dollar investment to help strengthen the agricultural sector. According to the Government of Nova Scotia (2018), the goal of this largely funded initiative is to create innovation within the province's agricultural sector in order to renew and strengthen the once robust industry. The Nova Scotia Department of Agriculture (2010) recognizes that retail food consolidation and the growth of regional distribution systems has created a more challenging environment for provincial vegetable growers in particular, and that the province's small-scale farms need increased access to larger markets. Despite the passage of ten years since the Nova Scotia Department of Agriculture report was released, this problem persists with many small farms experiencing limited access to larger markets. A food hub, due to its ability to aggregate product from multiple producers could serve as a possible solution to this challenge for some small-scale farms in the province.

1.3 Research Purpose, Questions, and Objectives

The purpose of this study is to assess the viability of, and the barriers to, the establishment of a food hub in Nova Scotia, Canada. The questions that guided this research are as follows:

- What are the potential benefits a food hub could provide to Nova Scotia from both the farm and retail perspective?

- What are the perceived barriers that are in place that might prevent a food hub from becoming a viable business in Nova Scotia from both the farm and retail perspective?

This research will directly seek to identify if a food hub could be a suitable business model within Nova Scotia's food system. Indirectly, this research examines the barriers in place that may be preventing Nova Scotia's local food system from scaling up production and distribution, as well as current opportunities that may be present for producers and consumers across the local food supply chain. It is important to note that this study was designed and data was collected and analyzed prior to the current COVID-19 pandemic.

1.4 Clarification of Basic Terms

Although local food is difficult to define in terms of geography, the USDA provides a very basic definition of a local food system (LFS). An LFS refers to place-specific clusters of agricultural producers of all kinds (farmers, ranchers, fisherman) along with consumers and institutions engaged in producing, processing, distributing, and selling foods (USDA, 2015). Throughout this research farmers who are growing food are referred to as "primary producers." Those who are purchasing food from farms in this research and are selling it to customers are referred to as retailers, which includes restaurants and grocery stores. There are a few different channels through which producers can sell the food they have grown. When primary producers sell their product to a retailer, most often a grocery store, or through a wholesaler, they are selling to intermediaries. Wholesalers are businesses engaged in buying and selling goods for resale or business use to retail, industrial, commercial, institutional, professional or agricultural firms, as well as to other wholesalers (Rosenbloom, 2013). Direct-to-consumer (DTC) sales are ways in which producers sell directly to consumers without using an intermediary. Examples of DTC selling are farmers markets or community supported agriculture (CSA's), where a consumer receives a weekly box or "share" of produce. CSA boxes can also sometimes include farm raised meat, dairy or homemade, 'value-added' products such as jam or baked goods.

Farm size is also mentioned throughout this study; however, small, medium and large-scale farms are often difficult to define as there is no universal standard for what constitutes a specific farm size, particularly when looking between regions and countries. However, a common practice to measure the size of farm in any one locale is based on gross farm receipts which are a totaled value of all expenses and revenue earned by the business before deducting taxes (Statistics Canada, 2020). Based on gross farm receipts, the USDA classifies a small farm as those making under $250,000, large farms between $250,000-500,000, and very large $500,000 or more.

1.5 Significance of Study

On a macro level, this research contributes to the broader literature of local food systems research. This study is focused on a particular geographic location, with findings and related challenges that are unique to Nova Scotia. However, it should be noted that many of the challenges faced by farmers in Nova Scotia are not unique to the province and are being felt and experienced by many rural communities throughout North America. This study adds to the greater body of research and literature that is emerging on local food systems, and specifically the sparse literature that exists on food hubs. Exploring emerging trends and ideas that are being implemented outside of the province could help solve problems within. This research is exploratory, and no other similar study has been conducted within the province to date. Additionally, these findings could be used as a baseline for future research to be conducted by individuals or organizations who may have an interest in creating a food hub-like business in Nova Scotia or updating the research conducted here in future years should conditions change. This study is unique as it provides insight from those who are active on both ends of the local food supply chain in the province. Exploring new concepts that could be implemented to help support the continued strengthening of the local food system in the province is needed in or to stimulate the economy. However, baseline research much first be conducted in order to understand if a particular approach or concept may be both practical and viable for Nova Scotia. This research also shares first-hand accounts and insight from local restaurateurs, farmers, and institutions on the current state of Nova Scotia's food system, adding to the limited literature on the topic within the province.

1.6 Research Methodology

This research uses qualitative methods in order to uncover information related to the guiding research questions and objectives. Qualitative researchers are interested in understanding the meaning people have constructed, that is, how people make sense of their world and the experiences they have in the world (Merriam, 2009, p. 13). This research uses what Caelli et al. (2003) describes as a "generic" qualitative approach, in which the researcher does not use a guiding theory or methodological framework. Being that this topic is exploratory in nature, it was found that a "generic" approach would be well suited for this study. This approach is suitable for a researcher who may want to "simply seek to discover and understand a phenomenon, a process, or the perspectives and worldviews of the people involved" (Merriam et al.,1998 p.11). In order to uncover a deep understanding of the topic under question, semi-structured interviews were chosen as a data collection method (Gill et al., 2008). Semi-structured interviews were used in order to allow for more flexibility within the conversation, which creates greater elaboration of insight into specific issues under discussion (Irvine et al., 2013). A generic interview guide was created in order to develop a set of both closed and open-ended questions, this style of interview guide is less rigid than a highly structured questionnaire-based interview, but more structured than an informal conversational interview (Gall & Borg, 2003).

1.6.1 Facilities and Materials Used in this Study

Interviews were conducted primarily in person at the participant's establishment, in a public space, or via phone call between August 2017 and November 2017. In each case, the conversation was recorded using a cell phone or laptop with recording capabilities.

1.6.2 Human Research Ethics Committee Clearance

Dalhousie University Human Research Ethics Board clearance was granted before the data collection phase of this research in 2017. An extension from the ethics board was applied for and granted as this research continued in 2018.

1.7 Organization of Thesis

This thesis is organized into five chapters: the first being an introduction, followed by an analysis of all relevant literature, methodology, results of the study, and a discussion and conclusion chapter.

Chapter 2

Literature Review

2.1 Introduction

Much of the literature surrounding local food systems and more specifically food hubs within North America, is provided largely by governmental and non-governmental organizations. The United States Department of Agriculture (USDA) has been heavily involved in research and program support surrounding the topic of local food systems (LFS) within the United States (U.S.). Recently, however, the department has become more involved in research surrounding the concept of food hubs. Many food and environmentally based non-government organizations (NGOs) in the U.S. such as Wholesome Wave and the Wallace Center at Winrock International, have been focusing more of their program efforts in support of food hubs as well. These research-based reports are typically in the form of case studies, surveys, interviews, feasibility studies, and literature reviews. In Canada, there is a general lack of national government-led research and reporting on subjects related to local food. It appears that the recent emergence of any reporting or literature surrounding the topic has been largely produced by provincial governments and NGOs. By conducting a general search of key words related to the topic, it is clear that there is limited literature on food hubs within Canada, which could, in part, be due to food hubs still being in their infancy within the country. Key words including: local food (Canada), local food systems (Canada), food hub (Canada), local food distribution (Canada), small farms (Canada), food systems (Canada) were searched within Google Scholar and SCOPUS in order to assess the availability of literature on Canadian food hubs. That said, some feasibility studies and reports are available directly from food hubs that are currently operational or hoping to become established within Canada. In this chapter I review some of the existing literature related to the state of and trends within North America's conventional and local food system, followed by a closer review of the literature related to food hubs and how they operate.

2.2 Direct-to-consumer Marketing of Local Food

Examining how locally grown food is currently marketed and sold through various supply chains is vital to understanding why food hubs have emerged. Over the years, direct-to-consumer sales have become a popular form of selling for farmers in North America (Park et al., 2014). DTC sales can help farmers capture more dollars. According to the 2012 U.S. Census of Agriculture, farmers who used DTC methods of selling owned less land and machinery, as they did not need as much as those who use conventional forms of marketing to achieve more sales (Low et al., 2015). Local food systems are also tied to the concept of shortened food chains (SFC), where there are less links in the supply chain and consumers are brought closer to the origins of their food, allowing for direct contact between producers and consumers (Faegan, et al., 2007). Direct market supply chains offer consumers detailed information about where, by whom, and how the product was produced (USDA, 2012). This model of selling local food directly to consumers was developed in direct opposition to the large scale, more industrialized systems of food products and distribution (Hinrichs, 2000). The concept of producers selling directly to consumers is nothing new, and was the primary method of distribution up until the development of the modern food supply chain. However, direct selling methods have evolved to include venues such as farmers markets, community supported agriculture (CSA), vegetable box schemes, and other cooperative distribution methods (Hinrichs, 2000). The number of farmers markets in the U.S. grew by 92% from 1998 to 2009 and they remain a popular form of direct-to-consumer sales that could be considered the historical flagship of local food systems (Brown & Miller, 2008; Diamond et al., 2009). Though farmers markets remain a popular venue for selling locally produced food, a major drawback is the time it requires for the producer to physically be away from the farm. Farmers must spend a considerable amount of time packing, driving, and selling at farmers markets (Low and Vogel, 2011).

2.3 Producer and Consumer Motivations

Both farmers and customers alike, can enjoy and benefit from direct forms of selling. Farmers can receive a larger proportion of the income generated by their crops, even out their cash flows, and re-gain control over their production decisions (Christy et al., 2013). Consumers are motivated bywanting access to fresh food, a desire to support local farmers and their community, and to engage in social interactions (Christy et al., 2013). Popular methods of local food sales such as CSAs and farmers markets naturally cause people to congregate and initiate social interaction (Hinrichs, 2000). In fact, Halweil (2003) states that sociologists have estimated that individuals at farmers markets have 10 times more conversations than in conventional supermarkets. Local food systems also help to foster a sense of community and shared values between consumers and producers (Bareja-Wawryszuk and Golebiewski, 2014). In return, these social connections influence the need to support what is locally produced, and allows the consumer to understand the high cost of cheapfood, and why local food can in some instances be more costly (Scott, 2010).

2.4 Economic Benefits of Local Food Systems

The technical revolution that gave rise to our current global, highly integrated food system and methods of mass production has lowered food prices, while at the same time it has dramatically limited farmer profits (Bareja-Wawryszuk and Golebiewski, 2014). In contrast to the global food system, local food systems have the capacity to benefit the local economy and farmers alike. A 2010 USDA case study report compared the structure, size, and performance of local food supply chains with those of mainstream supply chains (King et al., 2010). Findings from this research suggest that essentially all of the wages and owner income earned in the direct market channels studied were retained in the local economy (King et al., 2010). There is much research and evidence that local food systems have the potential to keep money and jobs in one geographic locale which can help to strengthen the local economy (Norberg—Hodge et al., 2002, Bendfeldt et al. 2008, O'Hara & Parsons, 2012; Swenson, 2009; Tootelian & Mikhailitchenko, 2012.). For example, in their report, *A Community-Based Food System: Building Health, Wealth, Connection and Capacity as the Foundation of Our Economic Future,* Bendfeldt et al. (2008) assessed the viability of a community-based food system within the Martinsville region of Virginia. Some of their key findings suggest that if households in Martinsville spent 15 percent of their weekly food budget on locally grown food, 90 million dollars in farm income would be created for the region. Rural communities in particular depend on farms, as farmers tend to spend their money within their local communities, as well as act as employers in their area (NSFA, 2010).

2.5 Current Food Sector Trends in North America

The consolidated ownership within the global food retail sector has had a dramatic impact on local economies, independent retailers, and farmers (Mount, 2011). The U.S. grocery market is the world's largest, second only to China, with major retailers Walmart, Kroger, and Safeway as the top three retailers (Progressive Grocer, 2019). Grocery shopping has remained a large part of U.S. and Canadian consumers lives. A study by the Hartman Group assessed 2017 U.S. grocery shopping trends based on both a survey and in-depth interviews. The study uncovered some changing trends in customer loyalty to traditional grocery stores, which witnessed a slow and steady decline of use of these stores for shoppers (Food Marketing Institute, 2017). Hartman Group (2017) explains that there is a common notion amongst consumers that 'food is everywhere.' The Hartman Group analysts call it the 'Roadside Pantry Effect' — the idea that consumers now navigate a world of 360-degree food availability, picking and choosing from a huge pantry of roadside as well as virtual options. Within Canada, the grocery sector is more consolidated than in the United States, with the "Big Three" retail companies: Loblaws, Metro, and Empire, representing the largest amount of ownership and control of Canada's food retail sector. Throughout North America, consumer demand for locally sourced food has been exploding, and is predicted to only continue growing (Feldmann & Hamm, 2015).

2.2 Changing Farm Structure

Although large food enterprises have contributed greatly to high food output and productivity across the food supply chain, there are still many disparities that exist along the chain (Berti & Mulligan, 2016). Evidence from both the Canadian and U.S. Census of Agriculture highlights the many changes happening to farms in both countries, including the increasing age of farmers, with the current majority falling between the ages of 55 to 65 years old (Statistics Canada, 2014; USDA, 2017). With many farmers approaching retirement and the current threat of climate change, a push towards investing in new, young farmers with a focus on more sustainable and resilient agricultural practices has emerged (Carlisle et al., 2019). In 2015, nearly 90 percent of farms in the U.S. were small-scale family operated farms, with annual gross cash farm income (GCFI) under $350,000 (USDA, 2015). Although these small operations make up a majority of farms in the U.S. they only account for 24 percent of the value of production (USDA, 2015). On the other hand, large-scale family farms in the U.S. which made up only 2.9 percent of farms in 2015, generated at least $1 million in GCFI and contributed 42 percent of total production nationwide (USDA, 2015). By comparison, family farms accounted for only 11 percent of agricultural production in the U.S. (USDA, 2015). Over the last two decades, Canadian farms have become fewer in number, but larger on average. In 1991, Canada had 280,043 farms, a number that declined to 205,730 by the 2011 Census of Agriculture and reduced the number of farm operators by 24.8% (Statistics Canada, 2011). Despite the decrease in farms and operators, average farm size increased from 598 to 778 acres (Statistics Canada, 2011). Although consumers seem to want local food, the demand puts added pressure on the conventional food system and large-scale producers continue to maintain their stronghold in the industry (Rogoff, 2014). As a result, many small and mid-sized farms are poorly served by our food system. These farms are either too small to compete in the global agricultural commodity markets or too large to sell directly to local consumers (Stevenson et al., 2011). As the divide between small and large producers gets wider, these small and mid-sized producers continue to struggle to find a place in the market.

2.3 Using Food Hubs as a Solution

Small and mid-sized farmers in North America remain marginalized. In recognition of the current struggles many of these farmers face, an alternative model of food distribution called a food hub has been developed. Food hubs have emerged as a solution to help increase market access for local and regional producers, by creating a single point of purchase for institutions and retail buyers who wish to "buy local," and provide economic, environmental, and social impacts on the local community (Barham et al., 2012). Being that the food hub concept is so new, there is still much to be understood regarding its viability in specific communities and systems. Current issues surrounding food hubs include creating a universal definition of a hub, access to financial capital, and economic viability (Fischer et al, 2015). Although many of these issues have been explored within the existing literature, a clear gap in research remains. Food hub literature is largely in the form of reports and case studies from either governmental and non-governmental sources. Some academic, peer-reviewed research on food hubs does exist and will hopefully only continue to advance.

2.4 Towards a Clearer Definition of Food Hub

An ongoing grey area is around food hub definitions. The USDA's definition of a food hub is consistently cited, and states that: "A food hub is a business or organization that actively manages the aggregation, distribution, and marketing of source-identified food products primarily from local and regional producers to strengthen their ability to satisfy wholesale, retail, and institutional demand" (Barham et al., 2012 p. 4). This definition may provide a good basic understanding of how a food hub typically functions, but a widely accepted definition has yet to be established. The USDA's definition is intentionally broad in order to allow for innovation and flexibility based on the recent emergence of the food hub business typology (Barham et al., 2012). However, understanding the intricacies of food hubs, what they *are* and what they are *not* is significant to establishing a universal definition. Table 1 displays three of the definitions that have been proposed by scholars, though these definitions still remain broad. Although they describe the basic role of food hubs, other key aspects and functions tend to be left out. Fischer et al. (2015) describes these other functions of a food hub as the "plus" activities many hubs carry out. These "plus" activities, or values that span beyond achieving financial goals, are what may separate a food hub from a regional food distribution business (Fischer et al., 2015). Based on an analysis of the concept, *Food Hubs: Definitions, Expectations, and Realities*, Fischer et al. (2015) suggests their own definition of a food hub as provided in Table 1.

Table 1

Proposed Food Hub Definitions

Blay-Palmer et al. (2013)	Horst et al. (2011)	Fischer et al. (2015)
"Networks and intersections of grassroots, community-based organizations and individuals that work together to build increasingly socially just, economically robust and ecologically sound food systems that connect farmers with consumers as directly as possible"	"A food hub serves as a coordinating intermediary between regional producers and suppliers and customers, including institutions, foodservice firms, retail outlets, and end consumers."	"Food hubs are or intend to be, financially viable businesses that demonstrate a significant commitment to place through aggregation and marketing of regional food."

James Barham, a researcher with the USDA, suggests that hubs are defined less by a particular business or legal structure, and more by how their functions and outcomes affect producers and the wider communities they serve (Barham et al, 2012).

2.4.1 Food Hub vs. Wholesalers: What's the Difference?

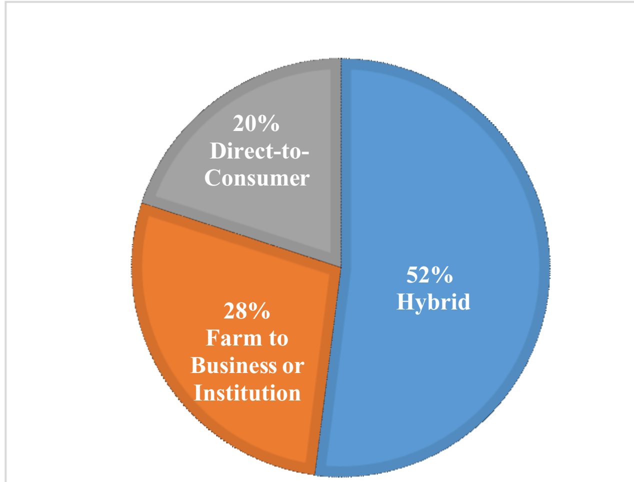
Mission-driven, values-based activities and roles of a food hub are what help grow regional food systems (Fischer et al., 2015). Mission-driven initiatives are usually aimed at providing support for farmers, the local community, or a mixture of both (Rogoff, 2014). Examples of hub-provided support for producers are typically in the form of technical farmer training and assistance such as season extension, packaging, branding, and Good Agricultural Practices (GAP) certification courses (Hardy et al., 2016). Fundamentally, many food hubs are seeking to pay producers a living, fair wage for their product (Barham et al., 2012). Providing community services is equally as important to many food hubs who often donate excess goods to local food banks or host cooking and nutrition classes for community members (Fischer et al, 2015). Given this information, some may wonder if a standard food distribution business that engages in community or producer services would also be considered a food hub. These grey areas still exist, but some scholars like Fischer et al. (2015) assert that there is indeed a difference in that "Food hubs are, or intend to be, financially viable businesses that demonstrate a significant commitment to place through aggregation and marketing of regional food" (Fischer et al., 2015, p. 97). That said, the question still remains as to how a food hub is classified, and if it is more important that this type of business is centered around aggregation of local food, mission-driven initiatives, or both.

2.4.2 Food Hub Business and Legal Structure

As with any business, a food hub's specific mission-driven initiatives, business, and legal structure are dependent on the region they are serving. For example, a hub located in an urban setting may have a non-profit business model with a focus on creating more access to healthy, affordable food for marginalized communities, in order to increase food security in the region. Alternatively, a food hub located in a rural area or near a metropolitan area, may have a for-profit business structure with a core mission of providing their producers with a fair price for product, while fulfilling the demands for local food in the region. Due to most of the research on food hubs being based on a specific hub or location, it is difficult to get a sense of how most food hubs typically function. However, the National Good Food Network (NGFN) operated by Winrock International, has collected U.S. nationwide data in both 2013 and 2015 through their food hub surveys. This data has helped to provide a greater understanding of the structure and function of food hubs in the U.S. In both the 2013 and 2015 NGFN Food Hub survey, 11 legally operating hubs were condensed into five categories based on their business structure: nonprofit, for-profit, cooperative, publicly owned, and other (see Figure 3). As seen in Figure 3, the majority of food hub market groupings were found to be hybrid, meaning their product is sold both directly to consumers as well as through wholesaling to retail grocers and institutions. In addition, it was found that some food hubs choose to sell directly to the consumer either through a CSA, mobile units, e-commerce, brick-and-mortar stores, or home delivery (Hardy et al., 2016).

Figure 3

Percentage of Current Food Hubs by Business Model Type Note. Adapted from Bielaczyc et al., 2020)



2.5 Food Hub Profitability and Funding

Regardless of a food hub's specific structure, all hubs function as an operational business. Therefore, understanding how to overcome challenges associated with running a business, such as affording startup costs, is very important for long-term viability (Fischer et al, 2015). Generating data and resources that can be readily available for food hubs could aid in their success as a business. However, as previously mentioned, most quantitative research available on hubs is in the form of case and feasibility studies for specific locations. The NGFN Food Hub Surveys do however aggregate national-level data that can provide a comprehensive understanding as to how food hubs are currently operating. Additionally, the 2014 *Counting Values: Food Hub Financial Benchmarking Study* also conducted through Winrock International, surveyed 48 hubs in the U.S. This study collected hubs' 2012 and 2013 balance sheets, income statements, statements of cash flow, and also distributed a survey to all food hub participants. Some of the benchmarking study findings suggest that food hubs typically operate at a close to break-even level (Fischer et al., 2015). For these businesses, many challenges arise that are inherent in the fresh food industry, where margins are notoriously low. Their revenue is heavily dependent on net product sales with fresh produce and herbs being a food hub's largest dollar sales volume category (NGFN, 2016). An additional, but small portion of revenue may come from delivery and brokering fees, vendor membership or customer fees and grants (NGFN, 2016). For food hubs, outside funding is usually needed to start up the business for at least the first two years of operation. According to the 2015 Food Hub Survey, food hubs had an average of about three initial funding sources. Both state and federal governments within the U.S. have begun to recognize the popularity of food hubs and the potential benefits they can provide for the local economy and agricultural sector. Given this recognition, government grants have been created in order to aid food hub start-up costs. Despite increasing grant funding options, the majority of food hubs currently rely on both foundation grants and personal capital provided by the business owner(s) (Fischer et al, 2015). It is very common for small businesses to rely on financial institutions to lend them money for start-up costs and other associated monetary needs. However, in the perishable food business this is often not the case. McCann et al. (2015) explains that many banks and credit unions loan money out on the basis of the business's inventory. If something goes wrong with a business's success, any available assets are liquidated and the bank will get its money back (McCann et al., 2015). However, in the case of food hubs or any perishable food business, inventory is in the form of fresh food, which is worthless once spoiled. The fact that hubs are not able to rely on financial institutions for loans is challenging, as they are capital intensive businesses. Fischer et al. (2015) analyzed the 2013 Food Hub Survey using a business efficiency ratio in order to assess food hub financial viability. The business efficiency ratio measures the total annual expenses to the total annual revenue. For the purposes of their analysis, operations with an efficiency ratio less than 1.00 have revenues that exceed their expenses, operations with an efficiency ratio greater than 1.00 have expenses that exceed their revenues (Fischer et al., 2015). This analysis yielded results showing that non-profit hubs had slightly higher average efficiency ratios as compared to for-profit or cooperatively led hubs. Food hubs that focus their business model on wholesaling and selling through a form of retail also had higher efficiency ratios. Based on the analysis, it appears that hubs that were highly reliant on grants had higher average efficiency ratios as compared to those that were somewhat, or not at all, dependent on grant funding (Fischer et al., 2015). This study concluded that food hubs that are not financially viable are those that have annual revenue under $500,000 (Fischer et al., 2015). Findings from this study as well as others, including the 2013 and 2015 food hub surveys, suggest that overhead costs are typically very high in food hub businesses. According to Winrock International's Financial Benchmarking Study (2014), successful hubs that were surveyed spent 12% of every sales dollar on overhead costs. Fischer et al.'s (2015) analysis, found that with each 1% increase in the proportion of a food hub's revenue that is spent on trucks and automotive equipment, the odds of the business not being financially viable increased by 15%. Similarly, each 1% increase for gasoline, tolls, and employee salaries and benefits also increased financial worries (Fischer et al., 2015). These high overhead costs could be a potential barrier for a food hub's growth and success, as the more overhead costs there are, the higher the volume of sales the business will need to generate. Aside from overhead costs, Cost of Goods Sold (COGS) and labor costs make up a large proportion of food hub expenditure. The benchmarking study also found that top performing food hubs that participated in the study spent 15% of sales revenue on labor, with the average spending just over 18% (NGFN, 2014). In an effort to curb labor costs, many hubs rely on both paid and unpaid labor. On average, food hubs were found to have 17 paid employees, with almost two-thirds of hubs indicating they use unpaid or volunteer staff (NGFN, 2016).

2.5.1 Food Hub Operational Efficiency

It is clear that food hubs may struggle to generate enough revenue in order to exceed their expenses and turn a profit. Due to the very slim margins in the perishable food business, generating enough revenue can be difficult. According to the benchmarking study's participants, a typical markup multiple is 1.17 percent (Fischer et al., 2013). This includes income from sales of a product and reflects any discounting, as well as the cost of all sold and unsold products. One tactic researchers have suggested is for food hubs to simply increase their markup. However, finding customers who are willing to pay significantly higher prices as compared to the grocery store, or even the farmers market, may prove challenging. The gross margin of a typical food hub is only 14.49 percent, which is equivalent to 14.5 cents of every sales dollar left to cover overhead and profit (Fischer et al., 2013). Each food hub business must have a good understanding of their customer base, and assess what market channels they will be selling through, as different customers demand different pricing. Matson and Barham (2015) observed that products can be sold at higher unit prices when selling direct-to-customer and can be economically viable at a lower level of gross revenue than wholesaling to grocery stores or institutions. Understanding the specific geographic location that a food hub is serving may serve as an indicator of their potential success, as outside factors in the region can potentially play a large role in the business's viability. For example, a rural area may not have the consumer base required to support a direct-to-consumer hub model (Rysin & Dunning, 2016). Considering this, Fischer et al. (2015) suggests a specific threshold of annual revenue a food hub should generate in order to cover basic operating costs. This illustrates the importance of having a good sense of the nuances of the region that the business is serving and operating within. Fischer et al. (2015) suggests that in order to be successful, a hub should ideally be generating $600,000 in annual revenue, spending 70% on COGS ($420,000), 15% ($90,000) on employee salaries and benefits, and the remaining 15% ($90,000) on fixed operating costs, packaging, warehouse payments, utilities, equipment, trucks, gas, and computers, as well as funding any mission driven services (Fischer et al., 2015). Food hubs also have associated financial challenges that arise from running social programs, managing grant funds, and ensuring that animal welfare, community and environmental health are taken into consideration (Fischer et al., 2015). These businesses may face difficulties while maintaining a manageable and viable expenditure profile. This includes keeping operations costs low, adequately paying employees and marketing a new business (Fischer et al., 2015). Based on Fischer et al.'s (2015) research, future grant funding needs to emphasize the importance that such capital can have on food hub growth, and how it may aid hubs in offering mission-driven services in local communities.

2.6 Successful Food Hubs

Understanding what has made successful food hubs so successful, and why other food hubs have failed, is key to assessing if it is a viable business model. In general, understanding how the food hub sector works is important not only to farmers and food hub operators, but also to investors, lenders, and grant makers, in order to understand where the risks lie at each stage of the business (NGFN, 2014). In general, successful food hubs tend to be operations that are well established, larger in size, and are a for-profit led business (Matson et al, 2011). However, there is also some concern that top performing food hubs are being repeatedly cited as success stories and may not be representative of all hubs. Although the current research that has assessed food hub finances has been significant, there is still a need for future research to be done, in order to understand how this business model can remain financially viable. What is known through the available literature is that food hubs that are profitable are often structured in a unique way that allows them to minimize overhead costs, charge high prices, or capitalize on efficiencies that are specific to that hub (Fischer et al., 2015). Again, the influence of external factors such as the size of the hub, the supply and demand in the region, as well as the seasonality of their geographic location can all play a part as to how successful a hub will be. It has been recognized that many of the most successful food hubs do not refer to themselves as a "food hub" in their business name, and many were established as regional distributors before the concept of a food hub even came to be. Many case studies have been carried out in order to understand the intricacies of successful hubs. Red Tomato, a New Jersey based food hub, does not own their own warehouse, trucks, or equipment. By outsourcing their distribution to third-party carriers, while still using technologically advanced logistics software, they are able to keep overhead costs low and systems streamlined (Matson et al., 2011). In 2013, Red Tomato, a nonprofit marketing and distribution organization based in Canton, Massachusetts generated $3.8 million in sales and supplied 22 retail chains (Fischer et al., 2013). Good Natured Family Farms in Kansas, La Montanita Co-Op in New Mexico, Cherry Capital Foods in Michigan, and Regional Access in New York are all examples of successful food hubs. What many of these businesses have in common is that they have differentiated their operations in some way, by selling to major markets like Kroger or Chartwells, having superior branding and management, and operating at a large scale. The aforementioned Food Hub Benchmarking Study (2015) has suggested that hubs that are able to generate $1.5 million in sales have the ability to spread their overhead costs over much more revenue, therefore reducing those expenses to just 12 cents of every sales dollar. Again, learning from food hubs that are currently in operation is vital to understanding how a hub in its infancy can also be successful. Each hub will always have their own unique set of goals that reflect the local community environment and are specific to their geographic location, yet there are still some fundamental lessons that can still be learned through studying existing hubs in North America (USDA, 2015). In 2015, researchers from the USDA conducted semi-structured interviews with eleven food hubs throughout the United States for their report, *Running a Food Hub: Lessons Learned from the Field.* This report is similar to a handbook and was created due to the lack of literature on the subject. The USDA saw an opportunity to provide "lessons learned" from those involved in starting and operating a food hub (Matson et al., 2015). The information gathered was aggregated into categories as seen in Table 2 below. By considering these "lessons learned," an individual, community, or organization looking to begin a food hub can refer to this handbook to get a sense of what makes for a successful hub. However, it is essential to remember that factors found in each local community may play a considerable role in the operations and success of a food hub.

Table 2

List of "Lessons Learned" From the Field

Customers	Determine who your customers are (retail, wholesale, organic) and tailor the FH's product and approach to suit the identified market.
Labor	Volunteer labor can be useful, particularly during startup or periods of growth. But long-term success requires regular employees.
Products	Seek to source and provide a mix of product that will allow you to satisfy demand or an identified need in the market.
Operations	Seek to find operational advantages through partnerships or by working with existing infrastructure in a region. Make sure to have sufficient funding to sustain operations until revenues are at a sufficient level.
Food Safety Certification	Allow the needs of the FH customers to dictate the certification requirements of the hub.
Transportation	Trucking (leased or purchased) and logistics will often be one of the largest costs of operating the FH. Know your costs to avoid delivery expenses exceeding order values.
Infrastructure	Infrastructure should be based on the product handling and storage needs of the FH, but FHs should incorporate a long-term view of infrastructure.
Software	There is no "one size fits all" software solution. Choose a software to suit as many needs of the FH as possible.

Viability & Success	Use any available funding to get started but have a long-term strategic plan to achieve operation profitability in order to ensure long-term viability of the business.

Note. Adapted from "Running a Food Hub: Lessons Learned from the Field," (USDA, 2015).

It may be advantageous for local governments to create resources for potential and existing food hubs with information that is tailored towards the specific region. Fortunately, many universities, NGOs, and local governments have already begun to collect data and create reports in order to expand the number of resources available for food hubs in their respective communities.

2.7 An Unclear Future for Food Hubs

There are currently over 200 food hubs operating in the U.S., while the exact number of hubs in Canada remains unknown (Rogoff, 2014). Findings from the 2015 Food Hub Survey found that the average age of a food hub in North America is eight years old, with 60% of hubs being established five or less than five years prior to when their research had been conducted. Given that food hubs are a relatively new concept, continued national-level research such as the NGFN Food Hub Surveys within North America are crucial to understanding the long-term impacts of food hubs. Within Canada, a nationwide survey similar to the NGFN Food Hub Surveys could be very beneficial in order to understand how existing hubs are operating within the country and how they have been successful thus far. There may be legitimate financial concerns in regards to food hub viability, however many hubs have been able to reach the goal of sourcing local food. More than 9 out of 10 food hub farm or ranch suppliers are located within 400 miles of the hub, and source from farms with less than $500,000 in gross sales (Hardy et al., 2016). In looking towards the future, researchers feel that industry partnerships with food hubs are key to bringing desired local food to the marketplace. Although food hubs may be able to help solve the main distribution challenges preventing producers from meeting the consumer demand for local food, greater engagement with the existing food distribution and wholesale industry is what food hubs must focus on in order to make a significant impact on how local food is offered to mainstream grocers (Barham et al., 2012).

2.8 Conclusion

Food hubs have emerged due to the absence of local food in our food system, and the neglect of small to mid-sized farms in North America. Although large food enterprises have contributed greatly to higher food output and productivity across the food supply chain, there are many disparities that exist along the chain (Berti & Mulligan, 2016). More than ever, it is harder for small and mid-sized family farms to gain market access (Berti & Mulligan, 2016). Many food hubs still remain engaged with conventional supply chains and may have the ability to create permanent change in the current supply chain, by increasing access to local food (Barham et al., 2012). Moving forward, clarity must be brought to the concept of food hubs in order to help grant writers, funders, policy-makers, as well as local and federal governments understand what a hub is and how it functions. Similarly, those involved with funding and the initiation of food hubs within a community, need to be aware of the financial hurdles associated with these businesses. Food hubs face many of the same challenges that all small and start-up businesses do, especially access to capital. As discussed, it is difficult to understand what makes one food hub more successful than another, as there are many different variables that affect success. There is also no single measurement that can be applied to all food hubs in order to measure success, as success or failure are dependent on a hub achieving their own goals (Matson & Thayer, 2013).

Chapter 3

Methodology

3.0 Chapter Introduction

The following chapter will detail the methodological approach of this research. To begin, the chapter will provide a broad discussion of the research methods, followed by a more specific examination of data collection methods, sampling, interview structure and data analysis. The chapter also includes a discussion of the validity and reliability of the results, bearing in mind ethics considerations.

3.1 Summary of Research Methodology

This research was conducted using qualitative methods. Qualitative researchers are interested in understanding the meaning people have constructed, that is, how people make sense of their world and the experiences they have in the world (Merriam, 2009, p. 13). Within the scope of a research project there is a methodology, which can be described as a strategy or design by which the researcher maps out an approach to problem-finding or problem-solving (Buckley and Chiang, 1976). Traditionally, qualitative researchers have used established approaches such as grounded theory, narrative analysis, phenomenology, or ethnography to guide their research methodology (Jackson, 2011). Each of these approaches have their own blueprint or steps that should be taken in order for the research to be considered credible. Additionally, within each research discipline there may be a commonly used methodology, such as anthropologists typically using a narrative analysis to guide their research (Cutcliffe and McKenna, 1999). This is particularly true in fields that have an abundance of literature and have been studied for many years, in which case there tends to be a set of research “best practices” (Creswell and Miller, 2000).

It can be challenging to choose the appropriate methodology and therefore one’s methods when studying a new and emerging phenomenon that there is a general lack of research on (Tracy, 2010). This challenge arose during the design phase of this research project as food hubs are a very new topic, only having been around on average for 11 years (Barham et al., 2012). Though literature on the subject is limited, the literature that does exist has largely employed the case study method (Cleveland et al., 2014; Stroink & Nelson, 2013; Severson & Schmit, 2015). A case study is an inquiry that seeks to understand a phenomenon within a real-life context (Yin, 2003). Using case study in food hub research can be useful when studying established hubs and hub-like business models, as case studies play a crucial role in business research and are widely used for analyzing and solving business problems and testing theories (Dul and Hak, 2007). That being said, in more exploratory work that questions the viability of a food hub in a particular geographic location, the case study approach may not be applicable. Exploratory research is used to understand a new and emerging situation that is not yet clearly defined and can be helpful to better understand the problem, although it may not provide conclusive results (Neumann, 1994). Rather, Neumann (1994) suggests that exploratory research can help lay the ground work for future inquiry. The nature of this research is exploratory; therefore, it was decided that a “generic” qualitative approach was most appropriate, meaning there would be no specific guiding methodology. Although an established methodology or philosophical underpinning was not used to guide this research, established qualitative methods and data collection tools were utilized throughout the study. Caelli et al. (2003) discusses the benefits and drawbacks of using a generic approach, and states that:

> "Generic qualitative studies are those that exhibit some or all of the characteristics of qualitative endeavor but rather than focusing the study through the lens of a known methodology they seek to do one of two things: either they combine several methodologies or approaches, or claim no particular methodological viewpoint at all" (Caelli et al., 2003 pg. 2).

The main drawback or concern some researchers posit in a "generic' qualitative approach is the lack of reliability of the method, as you are not basing your work on a more established and tested qualitative methodology (Caelli et al., 2003). In order to lessen concerns of credibility, researchers suggest four key points to address in a generic study as displayed in Table 1.

Table 3

Steps to Establish Rigor in Generic Qualitative Research

1. The theoretical positioning of the researcher	2. The congruence between methodology and methods	3. The strategies to establish rigor	4. The analytic lens through which the data is examined

Note. adapted from Caelli et al. 2003

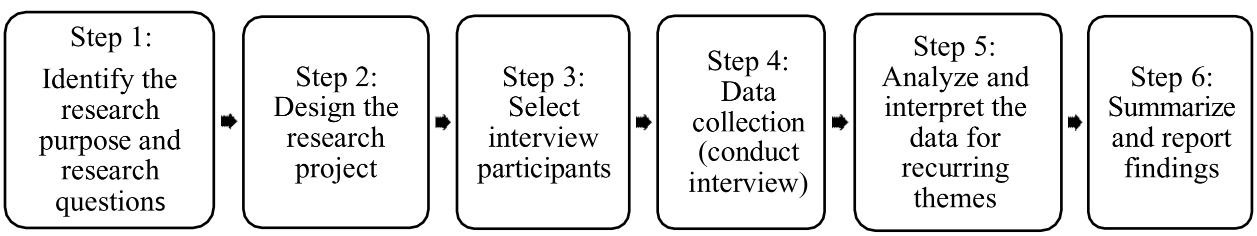
Although there is discourse as to what constitutes rigorous qualitative research, these steps served as a useful guide to help establish rigor within this research (Caelli et al., 2003). This guide was kept in mind and referred back to throughout each step of the research process.

3.2 Research strategy

The overall qualitative research strategy that I used was a step by step process as depicted in Figure 4 below, beginning with identifying the research purpose and question and ending with summarizing and reporting findings. Semi-structured interviews served as the primary research method and a review of literature on the subject matter was used to gather information from previously published research.

Figure 4

Qualitative Research Strategy



Note. Adapted from Austin and Sutton 2015

3.3 Selecting Interview Participants

As detailed in Figure 4, after establishing the design of the research project, the interview participants need to be selected. In order to begin the participant sampling process for semi-structured interviews, Robinson's (2013) four-point qualitative sampling approach, as displayed in Table 4 was used as a guideline.

Table 4

Robinson's (2013) Four-Point Approach for Qualitative Sampling

Name	**Definition**	**Key Decisional Issues**
Point 1 Define a sample universe	Establish a sample universe, specifically by way of a set of inclusion and or exclusion criteria.	Homogeneity vs. heterogeneity, inclusion and exclusion criteria
Point 2 Decide on a sample size	Choose a sample size or sample size range, by considering what is ideal and what is practical.	Idiographic (small) vs. nomothetic (large)
Point 3 Devise a sample strategy	Select a purposive sampling strategy to specify categories of person to be included in the sample.	Incentives vs. no incentives, snowball sampling varieties, advertising
Point 4 Source the sample	Recruit participants from the target population	Incentives vs. no incentives, snowball sampling varieties, advertising

Placing extra care and emphasis on sample selection is extremely important in order to ensure greater validity in interview-based qualitative research (Robinson, 2013). Following Robinson's (2013) approach provided a clear, linear guide that helped to narrow down the sample population, bearing in mind the guiding research questions:

- What are the potential benefits a food hub could provide to Nova Scotia Nova Scotia from both the farm and retail perspective?
- What are the perceived barriers that are in place that might prevent a food hub from becoming a viable business in Nova Scotia from both the farm and retail perspective?

Those who work in the production end (primary producers) and the retail end (retailers) of the supply chain were included in the sample population in order to understand the barriers to market access that producers in Nova Scotia face, as well as consumer access and motivations for purchasing locally produced food. Once the study was designed, I began the process of identifying and recruiting interview participants. I initiated this process by contacting industry experts (those who are professionally or academically involved and knowledgeable about Nova Scotia's food system) and asking them to recommend individuals who were either primary producers or retailers who might be interested in participating. Experts were first contacted via email and invited to participate in a phone conversation. In the resulting conversation, the study was described to the experts and an organic discussion formed thereafter. A snowball sampling method was then used to identify potential formal interview participants, a process that works primarily through referrals (Mason, 2002). Specifically, each expert was asked to provide a referral to someone whom they thought would be a good fit as a participant in the study. Subsequent to calls with experts, contact was attempted with all potential interviewees using either e-mail or telephone to formally invite them to participate in the research. In some instances, contacts referred to by experts never responded to invitations to participate, or declined to participate in an interview. Consequently, it often took multiple referrals to identify a participant who was willing to be formally interviewed for the research. In addition to the "dead leads" challenge that arose from the snowball sampling method used, other issues that were encountered with respect to recruiting willing interview participants was that the sample population of mainly primary producers and restaurateurs are typically extremely busy and often have non-traditional work hours.

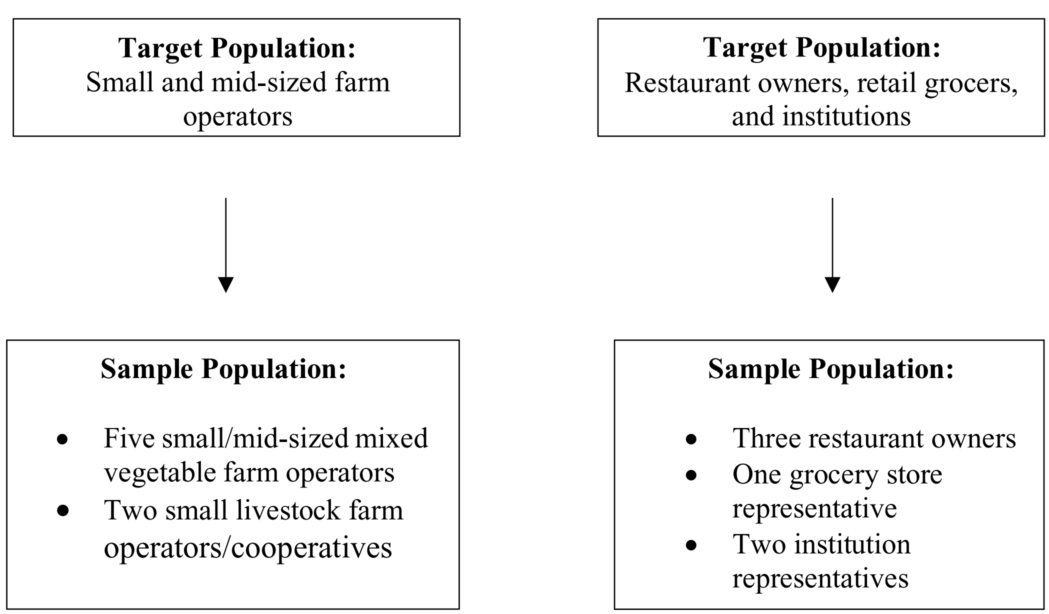
Due to the difficulty scheduling with several initially willing participants, it was decided that in order to stay on track with the research timeline, the sampling approach would have to be altered. Therefore, a purposive sampling technique was used as an alternative approach, in hopes that more study participants could be recruited and would offer more scheduling flexibility (Robinson, 2014). Purposive sampling is a strategy that is used frequently in qualitative research, specifically to identify and select information-rich cases that will yield the most effective results (Patton, 2002). This sampling technique allows the researcher to identify and select individuals or groups of individuals that are knowledgeable or have lived experience with the phenomena being studied, and the involvement of certain individuals may provide a unique and important perspective therefore their presence should be ensured within the research (Creswell and Plano Clark, 2011; Mason, 2002). After adopting a purposive sampling approach, finding study participants became easier. Specific retailers and primary producers were sought out for this study as their perspective was deemed fundamental for the research. For the interview subject category of restaurant owners, only establishments located in peninsular Halifax (the city's urban core and its immediate residential areas) were purposively sampled, as urban centers are primarily where demand for local food is highest. The "Taste of Nova Scotia" website, part of a provincial initiative that promotes local food and identifies restaurants that are committed to purchasing locally produced food, was used in order to identify potential interview subjects. Establishments were contacted and their owners were invited to participate in the research. When sampling and recruiting farmers, the previously mentioned snowball, or referral approach was successful for obtaining roughly fifty percent of study participants. The remaining farmer interviewees were recruited using purposive sampling and were first identified as possible participants based on their farm size and type. Small, mixed-vegetable farms that sell DTC are the typical partners of a food hub (Barham, 2011). Therefore, farmers that sell DTC were sought out by searching the listed vendors on local farmers markets websites and were contacted via phone or email.

3.3.1 Sample Selection

Ultimately, an idiographic and relatively small sample size of 13 interview participants was decided upon with seven drawn from amongst primary producers and six representing retailers (Figure 5). Amongst retailers, three sub-groups are represented amongst those interviewed including: a farm-to-institution program, a University food service company, multiple restaurant owners, and a representative from a regional grocery store chain. On the primary producer end, livestock farmers as well as small to mid-sized mixed vegetable farms were included in the sample population

Figure 5

Interview Target and Sample Population Used in this Research



In following Robinson’s (2013) qualitative sampling guide, exclusion and inclusion criteria were taken into consideration when deciding upon the sample population. Within the primary producer sample population, a mixed variety of farmers were sampled in order to generate insight that is representative of Nova Scotia’s agricultural sector. Food hubs have emerged in response to help small and mid-sized farms scale-up production and find opportunities to sell their products (Martinez et al., 2010). Therefore, owners or operators of small produce and livestock farms were the primary sample population.

3.3.2 Data collection methods: Semi-structured interviews

Semi-structured interviews were used as the data collection method in this research due to their ability to uncover a large amount of information (Gill et al., 2008). Particularly, semi-structured interviews prove very useful if the topic is exploratory in nature as they can help provide more rich insight (Gill et al., 2008). This method involves asking the interviewee a series of open-ended questions that are based on the topic the researcher is exploring (Irvine et al., 2013). With this method, a researcher is typically prepared with a list of questions, but they can still ask additional questions that may arise during the interview in order to gather more information from the interviewee (Irvine et al., 2013). Once the interviewer establishes a positive dialogue and trust with the interviewee, in-depth information may surface. If the interviewee only provides a surface-level answer, the interviewer may ask some more questions in order to prompt a more comprehensive response (Turner, 2010). However, a drawback of semi-structured interviews is that it is labor intensive, as there is very careful consideration and time taken to craft questions, as well as the time-consuming transcription of recorded interviews (Turner, 2010).

3.3.3 Gaining consent and access

Gaining access to those being interviewed was not overly challenging. Each participant who agreed to participate was generally friendly and eager to share information. Each participant granted both verbal and written consent (consent form, Appendix E) in advance of the interview, which was also reiterated before the start of the in-person or phone interview. Many ofthe small-scale farmers deal with the public on a regular basis and other participants such as restaurants owners interact with customers on a daily basis. Because the subjects are largely in thepublic eye and not considered vulnerable populations, it was easy to gain access and consent.

3.3.4 Interview method

For this research, five of the interviews were conducted in person, while the remainder were conducted over the phone. Although in-person interviews are the ideal scenario for this data collection approach, they are not always feasible (Irvine et al., 2013). While in-person, the researcher can build trust with the respondent, and both parties can read each other's body language (Gill et al., 2001). Due to the timeline of this project, the data collection phase fell within the summer months when farmers tend to be extremely busy. Phone interviews were therefore deemed the bestsolution for interviewing those who were interested in participating but were either geographicallytoo far away from the city to be accessible to the researcher or too busy for an in-person interview. However, Novick (2008) points out the positive effect a phone interview can have on the respondent, making the participant feel more concealed and relaxed, therefore potentially providing more organic and insightful information. At the same time, phone interviews may havethe opposite effect, since an individual may not feel as comfortable over the phone as in person, causing them to hold back pertinent information (Roulston, 2010). Building rapport is an essentialpart of a qualitative interview, whatever the mode, as it puts the respondent at ease. Leech (2002), recommends finding a middle ground between acting over-interested and completely aloof. Simple interview strategies can be used, even over the phone, to show you are listening and engaged in the conversation. For example, the interviewer can easily indicate that he or she will be moving onto the next part of the interview by simply paraphrasing the respondent's answer to the last question for clarity (Leech, 2002). This approach signifies you were actively listening to the participant while allowing you to gain clarity on their response and keeps the conversation flowing (Leech, 2002).

3.3.5 Interview guides and questions

When designing a semi-structured interview guide it is best to start off with more direct, easy to answer questions (Gill et al., 2008). For this research, pre-planned questions were asked to each participant to help initiate the interview conversation and lay the ground work with some baseline information. It was kept in mind that the questions should not be too technical as it could be challenging for participants to answer very specific questions. Gill et al. (2008) suggest designing questions that will yield the most information possible. Therefore, after the first few background questions were asked, the remainder were kept more open-ended. This interview structure tends to be more comfortable for participants and will generally yield more responses as a natural, thought guided conversation flows (Roulston, 2010). Given that interview participants represented different business types: restaurants, primary producers, retailers, etc., an interview guide was created for each sub-group, using specific questions and language consistent with each industry, examples of which are provided in Figure 6 below. Each interview was structured with a beginning, middle, and end in mind, the closing structure was the same for each interview. Being that these were semi-structured interviews, follow-up and probing questions unique to each interview came up organically throughout conversations with participants.

3.3.6 Farmer Interview Questions

The focus of interviews with farm operators was to understand their sales strategies and selling preferences, and if they feel there is enough consumer demand for their product. The beginning of these interviews were set-up to establish baseline information including:

- How long they have been in business
- The size of their farm
- What they grow or raise
- How they sell their product
- What are their most lucrative products

The middle of the interview was structured with questions that were designed to gauge the following:

- Major challenges they face within their business
- How they perceive consumer demand
- Are they operating at their capacity?
- Are they comfortable with how they currently sell their product, or are they looking for new opportunities?

3.3.7 Retail Representative Interview Questions

Interviews with representatives from retail businesses were focused on understanding their motivations for purchasing locally sourced food, as well as their local buying preferences. Similar to interviews with farmers, the beginning of these conversations were set-up to understand the business model of the retail business under discussion. This included asking for:

- A description of their business and the geographic area they serve
- How many customers they serve on a daily and weekly basis
- What types of food are served, and some of their most popular items.

The middle of the interview was structured as to gain an understanding of:

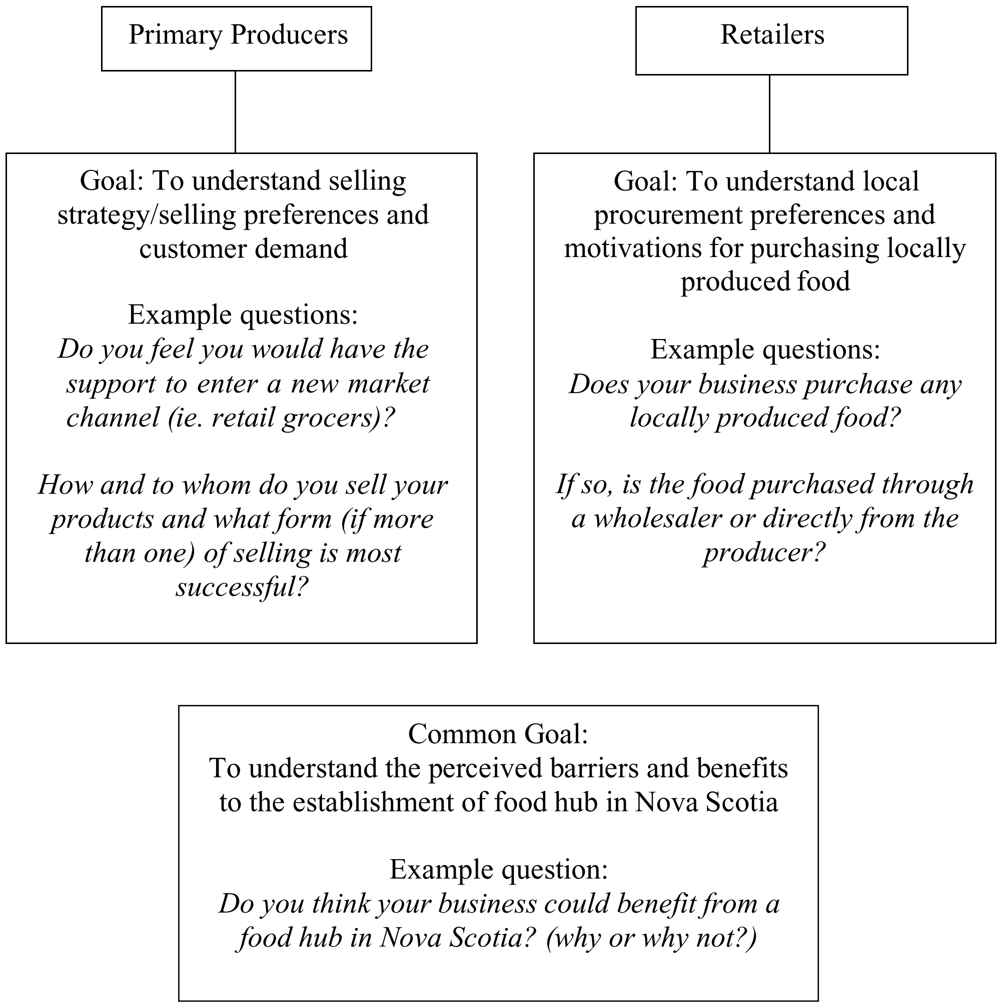
- How the business procures their food both local and out of province
- If they are satisfied with their supplier(s) and the availability of locally produced food
- How they perceive customer demand for local food
- Are they looking to include more local food within their business?
- If they promote their buy local program.

3.3.8 Interview Closing Questions

Each interview closed with the larger, overarching question as to whether or not a food hub would be a viable business model that could be beneficial for the province. Providing the National Food Hub Collaboration (2012) definition to all respondents ensured that they all had the same general understanding of what a food hub is before further questions were asked. The closing questions were largely underpinned by the primary research questions. These questions were designed to gauge the open or closed mindedness of the participant to the idea of a food hub being established within Nova Scotia. A follow-up question was used to understand what the interviewee perceived as benefits or barriers to the establishment of a food hub in the province and more probing follow-up questions were asked in order to gather a deeper understanding if needed.

Figure 6

Goals and Example Questions of Semi-Structured Interviews with Primary Producers and Food Retail Interview Participants



3.3.9 Setting interview times and locations

Setting interview times and locations can be challenging, especially when coordinating with those who are consistently busy during business hours. However, the flexibility of a graduate student schedule can also be beneficial to finding a time and place that works best for the participants. There were some challenges associated with finding an appropriate interview location, as some of the farms were located several hours from Halifax city center. With no funded budget for travel expenses, the solution for both the researcher and interviewee was to set up phone interviews. These phone interviews usually took place in the early mornings before or late evening when their work day was complete. For farmers that were within a reasonable travel distance, in-person interviews were set up at the farm locations. A few in-person interviews had to be rescheduled due to personal schedules, but were usually postponed to the soonest date and time. When on a physical farm location, the interviews took place either in an office or homestead. One specific interview was conducted in the farmer's field which presented its own challenges including background noise as well as the interviewee being generally distracted and preoccupied. One farmer who was located very far from Halifax, asked to meet at a halfway point. In this case, it was important to pick a location that was not too noisy for the recording device or too crowded and distracting. The meeting location was first set to be at a Tim Horton's coffee shop but was determined to be too noisy for a successful interview. An alternate nearby location, the lounge area of a nearby hotel, was chosen and ended up a much quieter and appropriate meeting location. Restaurant owner participants were almost always interviewed within the city of Halifax, which was much more accessible for scheduling and proximity. These interviews often took place at the specific restaurant location during off hours. Some participants did request to connect on the phone due to availability and busy work schedules.

3.3.10 Structure of interviews

Each participant had some familiarity with the interviewer prior to the interview taking place, due to an initial phone conversation that had occurred to provide some context to the nature of the research and see if they would be interested in participating. However, interviews typically began with a brief introduction of myself, the lead researcher, including information on my Master's program at Dalhousie University and some context for the research topic. This allowed each person to be completely comfortable and understand the scope of the study. As a next step, I provided an overview of the type of questions I would be asking, starting with more general inquiries about their business, followed by more specific questions related to the nature of the research. The overall goal was to keep the interview flowing like a conversation and document a robust amount of information and data. Initial questions were developed to be more straightforward and collect basic contextual information on the individual and their business, in which some interviewees elaborated on more than others. However, if any explanations throughout the interview required further clarification, probing questions were asked to help the participant elaborate on a topic. Probing questions were also asked if more information was needed from the interviewee. According to Taylor-Powell and Camino (2006), probing questions should typically begin with "what" or "how," as they invoke for details from the participant. Examples of probing questions include (Taylor-Powell and Camino, 2006):

- *Could you say more about that?*
- *I'm not exactly sure what you mean by that…could you give me some examples?*
- *What makes you feel that way?*

In all cases, each interview came to a natural end-point, after questions had been asked and the interviewee did not have any more information to add or elaborate on.

3.4 Data Management

The data collected from this research was managed using a computer-assisted qualitative data analysis software (CAQDAS), called NVivo. (version 11, QSR International) Each interview recording was loaded onto the software and transcribed directly in the program. A backup of the data was periodically loaded onto an external hard drive for safety. All information was stored in a way that protected the privacy of the data and the participants by assigning pseudonym rather than their legal name to the associated data.

3.5 Data analysis

For the data analysis portion of this research, a rather flexible method of analysis was used called thematic analysis (TA). Maguire and Delahunt (2017) draw on Braun and Clarke (2006) to suggest that TA is one of the first qualitative data analysis methods that should be used, as it provides a foundation and skill that are useful when adapting other forms of analysis.

Particularly, they also mention that TA is more of a method rather than a methodology, which is useful when the research is not aligned to a particular theoretical perspective (generic research) (Braun and Clark, 2006; Maguire and Delahunt, 2017). Both Castleberry and Nolen (2018), as well as Maguire and Delahunt (2017) offer guidance for doing TA. By definition, thematic analysis is a qualitative data analysis technique that analyzes the data in order to identify patterns and themes within the data (Maguire and Delahunt, 2017). Braun and Clark (2006) created simple steps that were followed while analyzing the data to successfully carry out TA as seenin Table 5. Depending on the data set, this may be an iterative process in which the researcher carries out these steps multiple times (Maguire and Delahunt, 2017).

Table 5

Steps for Conducting Thematic Analysis

Step 1: Researcher familiarizes self with data
Step 2: Generate initial codes
Step 3: Find emerging themes
Step 4: Review the themes that have emerged
Step 5: Define the themes
Step 6: Write about the theme

Note. Adapted from Braun & Clark, 2006

For this research, becoming familiar with the data began when the recorded interviews were carefully listened to and accurately transcribed. Once the interviews were transcribed, they were printed out and carefully reviewed multiple times. As a next step in the analysis, manual coding was employed using highlighters and notes, a step that helps the researcher become more familiar with the data and generate initial categories (Basit, 2010). Although a CAQDAS was used for analyzing the data electronically, there can be some drawbacks associated with this method. Rodik and Primorac (2015) suggest that the software may disrupt the interaction between the researcher and the data, and that using a paper and pencil may be a more natural way of getting to know the data. For that reason, physical prints of the transcripts were incorporated in the initial analysis stages. Following the physical review, a second round of coding was done using NVivo, in order to further understand the data and generic themes. The general process of coding the data takes a large set of data and condenses it into more digestible pieces of data to work with (Maguire and Delahunt, 2017). Therefore, compiled data were first coded using keywords that appeared that were then further narrowed down as the analytic process continued. Once the initial coding phase was completed, themes were identified. Themes can be described as broader, significant categories that emerge from the data (Maguire and Delahunt, 2017). A researcher should consider asking themselves the following questions when determining collective themes (Castleberry and Nolen, 2018):

- Is this a theme or just a code?
- What is the quality of this theme—does it tell something useful about the dataset?
- What does the theme include and exclude?
- Is there enough compelling data to support this theme?

As displayed in Table 5, Step 5 of Braun and Clarke's (2006) guide to conducting a TA is to define the identified themes. A useful approach for defining themes is to create a thematic map so you can visually understand the relationship between themes (Maguire and Delahunt, 2017). NVivo was very helpful for achieving this step, as the software has a mapping tool which can automatically pull from all of your stored and coded data.

3.5.1 Presentation of results

Direct quotes from interview participants, and metaphorical display are used to present the results of this research. Metaphorical display can be useful in order to provide a visual representation of the results by utilizing a symbol that is widely understood, while direct quotes that are illustrative and succinct can be helpful in representing a theme (Verdinelli and Scagnoli, 2013; Lingard, 2019).

3.6 Research design considerations of rigor

Morse et al (2002), stated that without rigor research is essentially worthless, becomes fiction, and loses its utility. Historically, the method in which rigor is achieved in research is tied to the theoretical approach the researcher is using (Caelli et al., 2003). However, researchers who are taking a more generic approach, wherein they are not aligning themselves with any particular theoretical approach do not necessarily have specific criteria to establish the rigor in their research. In order to ensure rigor, Tracy (2010) has proposed a universal set of criteria of quality in qualitative research which includes: worthy topic, rich rigor, sincerity, credibility, resonance, significant contribution, ethics, and meaningful coherence. This set of standards, was used as a guide throughout the entirety of this research project in order to ensure the steps to create valid and reliable research were being closely followed. Tracy (2010) suggests the researcher ask themselves four specific questions to establish rigor in their study:

- *Are there enough data to support significant claims?*
- *Did the researcher spend enough time to gather interesting and significant data?*
- *Is the context or sample appropriate given the goals of the study?*
- *Did the researcher use appropriate procedures in terms of field note style, interviewing practices, and analysis procedures?*

Adhering to these guiding questions, along with providing transparency in the research design and analysis process, helped establish rigor throughout the entirety of this research. Some of these questions were helpful in understanding if enough data had been collected and data saturation had been reached. Tracey (2010) points out that the researchers that are the most successful are those who are willingly self-critical, view themselves through the eyes of others, all while remaining resilient and considering their own well-being.

3.7 Ethics considerations

All ethical concerns were addressed and in full compliance with the Dalhousie University

Research Ethics Board (REB). A REB application was submitted and approved after implementing the ethics board's amendments. Ethics considerations include keeping the identify of each interview participant private, as well as providing the interviewee with a formal consent form prior to the scheduled interview. The consent form was verbally reviewed with the participant and signed by them prior to the start of the interview. All materials are kept under lock and key and computer materials are only accessible by the lead researcher via passwords. In the case that a participant decided to withdraw from the study, all materials would be destroyed.

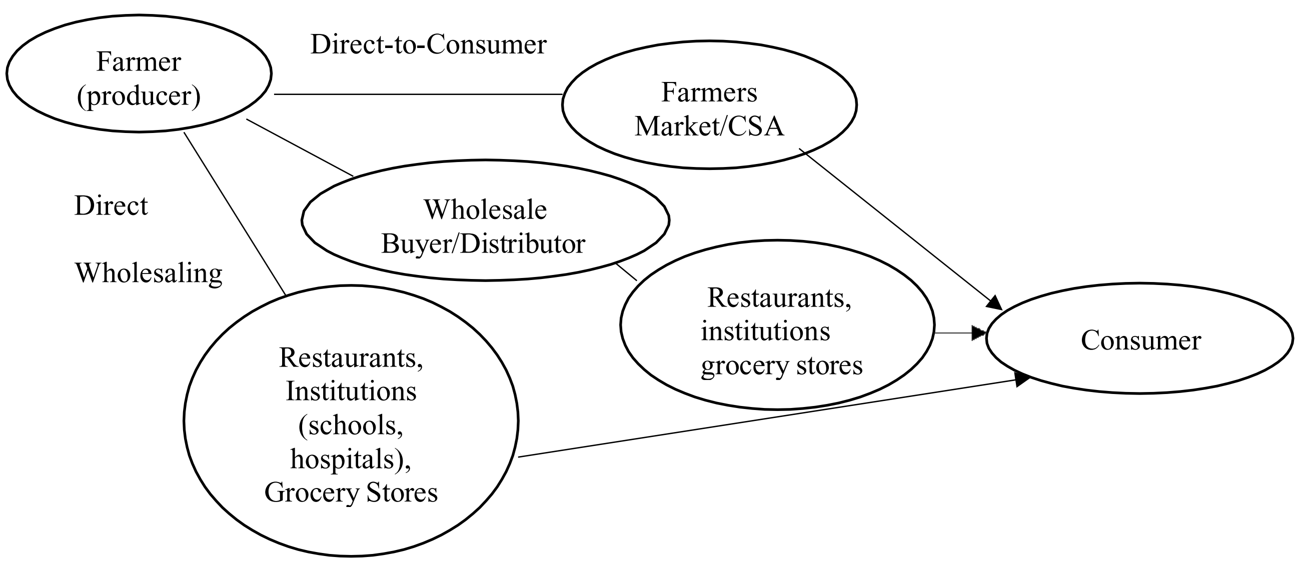
Chapter 4

Research Results

4.1 Introduction

The purpose of this chapter is to present results collected for this research. Data were generated using semi-structured interviews with 13 individuals from Nova Scotia's local food supply chain. For the purpose of this research the "primary producers" in the supply chain were local farmers, and "end users" were representatives from the retail industry that included restaurants, wholesalers, institutions, and grocery stores. The type of local food supply chain is representative of what is known as a Short Food Supply Chain (SFSC). Figure 7 provides an example of what a SFSC might look like in Nova Scotia. These food chains reduce the number of intermediaries that are involved with post-production handling, transportation, and distribution of local food in order to create more interaction between farmers and their customers (Galli and Brunori, 2013).

Figure 7 *Example of a Hypothetical SFSC that may Exist in Nova Scotia*

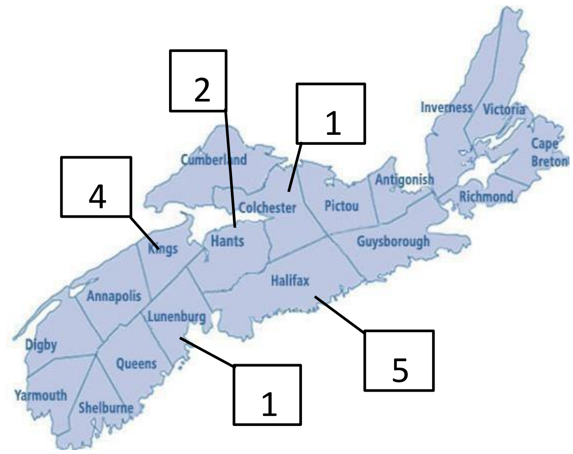


4.2 Semi-structured Interviews

Each individual interviewed within the supply chain shared their attitude towards specific methods of food distribution or procurement in Nova Scotia, and provided knowledge that informed the results of this study. As indicated in Figure 8 the interviewees represented businesses that are located in various a variety of areas throughout the province, with a majority of the farms being located in Kings County and retail businesses located in Halifax County. Understanding how local food currently moves through the supply chain in the province as well as producer and buyer preferences is vital to informing this research which has been guided by the following questions:

Figure 8

Interview Participants' Business Locations by County



- What are the potential benefits a food hub could provide to Nova Scotia from both the farm and retail perspective?
- What are the perceived barriers that are in place that might prevent a food hub from becoming a viable business in Nova Scotia from both the farm and retail perspective?

Major themes that emerged from the data that were collected are broken down by each sector that interviewees represented. The main themes that emerged from this research will be discussed inclusive of direct quotes from interviews, that encompass the key results and overarching themes. The perceived benefits and barriers to the establishment of a food hub in Nova Scotia are shared by primary producers, restaurant owners, institutions, and retailer, Table 6 provides a breakdown of interview participants based on the type of business they represented. Interviews were conducted, until it was determined that data saturation was reached. A natural data collection end point was found once there was a redundancy in themes that emerged when analyzing the data (Faulkner and Trotter, 2017).

Table 6

Interview Participants by Business Type

Business Type	Number of Participants/Interviews
Restaurant	3
University	1
Farm-to-School	1
Retail Grocer	1
Agriculture	7

4.2.1 Primary Producers

Seven farmers from Nova Scotia participated in semi-structured interviews for this research. Small farms are often the most common suppliers of food to food hubs as they often struggle to have enough volume to enter larger markets, such as retailers, on their own (USDA, 2011). In order to better understand Nova Scotia's local food supply chain and the potential benefits and barriers that a food hub could have in the province, it was essential to speak directly with farm operators. Each farmer that was contacted represented an operation that varied in size, commodity type, and location (Table 7).

Table 7

Description of Farm Participants Including Their Primary Commodities, Farm Size and Generalized Location

Farmer (A-G)	Farm Commodity Type	Farm Size	Farm Location In Nova Scotia
Farmer A	Organic mixed vegetables cut flowers and herbs	6 hectares	Colchester County
Farmer B	Mixed vegetable	1.6 hectares	Kings County
Farmer C	Mixed vegetable	2.4 hectares	Hants County
Farmer D	Mixed vegetable	161 hectares	Kings County
Farmer E	Mixed vegetable	5.6 hectares	Kings County
Farmer F	Sheep/Lamb	27-member cooperative	Hants County
Farmer G	Beef	121 hectares (75-85cattle/year)	Hants County

4.2.2 End Users of the Supply Chain

The typical customers of food hubs are restaurants, institutions, and grocery stores. Therefore, in order to understand the viability of a food hub in Nova Scotia, those who represented the potential end users of the local food supply chain were also interviewed (Table 8). This included semi-structured interviews with either the owner of a particular business or an individual that manages the purchasing of food within a particular business or institution.

Table 8

Characteristics of Food End User Participants Interviewed, Organized by Sector Type

Three Restaurant Owners	**One University Food Service Nutritionist**	**One Farm-to-School Program Coordinator**	**One Regional Grocery Store Chain Representative**
Representing five restaurants located in downtown Halifax, Nova Scotia **Restauranteur A:** Co-owner of a 50-seat Spanish tapas restaurant **Restaurateur B:** Owner of a 90-seat modern French bistro **Restauranteur C:** Owner of fast casual burger restaurant, farm-to-table restaurant, and beer bar	Nutritionist within University food service withover 15, 000 students, located in Halifax, Nova Scotia	Coordinator for government-led program, operating in 22 primary schools located in the South Shore of Nova Scotia	Manages local purchasing for all 80 retail locations located within the Maritime provinces of Canada

Interviews were conducted in order to understand the retailers local buying preferences, motivations for purchasing local, how they source local food, and their overall attitudes and understanding of the local food supply chain in Nova Scotia.

4.3 Identifying Common Themes

As the data was analyzed and themes were identified, there were many commonalities that emerged between interviews across sectors of Nova Scotia's local food economy including:

- Issues with wholesale purchasing and selling of local meat and produce
- Challenges associated with the growing seasons in Nova Scotia, including a lack of consistent and sufficient volume of year-round produce
- A lack of farmer cooperation
- Using local food as a marketing tool
- Easy access to locally sourced food

4.3.1 Wholesale Purchasing and Selling

Both restaurant owners and farmers alike had negative attitudes towards wholesale selling or purchasing as it is currently done. From the farmer's perspective, the act of selling their product wholesale to either an intermediary business like a distributor, or directly to a restaurant, has generally been considered a negative experience. Some farmers described experiencing added pressure and stress to provide specific produce and quantities on a regular basis to restaurants, and that it is not always entirely possible to do so when there are so many factors in farming that determine the success, volumes and availability of the produce you are growing such as weather and pests. Example quotations from farmer respondents that illustrate these challenges include:

"So, we decided that we didn't really like pre-promising crops, because it became a stress. For us the farmers market is not stressful at all, we bring what we have at the quantities that we have, we

don’t have to worry about not having enough and it’s really pleasant.” -Farmer A

“I’m not really keyed into wholesaling. We've tried wholesaling to a local grocery store and I've never really gotten anywhere with it. They just don't order from us, we do a little bit of wholesaling to other people and we find the volume is really low. It takes forever to get paid, lots of paperwork just, at least in Nova Scotia it just doesn't seem to be that attractive to us.” -Farmer C

The majority of farmers interviewed expressed that the ease of selling their produce directly to consumers either through a CSA or a farmer’s market is most ideal. Similarly, for restaurant owners, there is a preference to buy directly from farmers, as opposed to a wholesale distributor such as Sysco. All restaurant owners interviewed stated that they enjoy the social aspect purchasing direct from the producers, as well as the fact the farmer is very knowledgeable about their product. For example:

“We want to know who the producers are and who the farmers are that we do use. That's just the Slow Food belief, so it's important to us to be a part of that discussion and community. I certainly doubt that we would dispense with the rest of the mechanisms that we have in place if there was a food hub-like business around. Being able to go to the farmer’s market on a Saturday or a Sunday and not just order or pick up from one of our producers, but sit there and have a conversation and see where they are at and what problems they have been facing that season.” -Restaurateur C

There was also clear frustration from the restaurant owner perspective around working with smaller local distribution companies that offer local food, due to their lack of knowledge, the quality of product, and accounting inefficiencies. Examples of these issues raised include:

“I find that the more efficient the accounting is on their end the more likely people are to order from them because that’s a huge hiccup. Especially when you're a small business. It’s unmotivating to work with them because if you're trying to pay a bill we've said we've paid it they say we haven't.” -Restaurateur A

“If I want yellow carrots and the guy on the other end of the phone doesn't know what a yellow carrot is or parsley or rutabaga, or a certain kind of fish, it's very annoying and we have seen that

happen. You have a small company working well and then a bigger company comes and buys it and restructures that place and then you are talking to different people who aren't trained. The lack of organization on the other side can be very frustrating.” -Restaurateur B

For the institutional representatives interviewed, there is an added issue when it comes to quality and buying local produce when they have a contract with a food service provider like Aramark. The representative from a farm-to-school program interviewed stated that the quality and price of the product from their food service provider is often inconsistent, so the school cafeteria staff prefers to pick up their own produce at the grocery store, as explained in the quotation below:

“They know they can get better produce at the store so they can pick up the bag of carrots and they can see oh no bruises, no rot on it, it's good. Whereas when it comes from our distributor, it’s usually at a higher price than the grocery store and the quality is not consistent, so it makes it really difficult when you have 100 kids in front of you and you haven't got what you asked for.”
-Farm-to-School Program Coordinator

4.3.2 Failed Businesses

Between farmers and restaurant owners interviewed, a few had either been a supplier for, or had been a business partner of a failed wholesale distribution business. The notoriously slim profit margins in the food business, coupled with the lack of volume needed to scale up the business, were cited as challenges for a local food distributor in Nova Scotia. For some business owners interviewed, seeing these types of operations in Nova Scotia fail throughout the years seems to have tarnished their feelings on the topic. The quotations below provide an example of these sentiments that were shared throughout their interviews:

“*All around, between the farmers and us, our margin on food are so slim. So, if someone was to deliver that food, the margins would be slim as well. There have been people trying to do that business going to the farm and coming back, but with a lack of management and really understanding the process, after a year or two the business goes down.”*-Restaurateur B

"I don't think, we're developed enough for it here in Nova Scotia, yet. I think, I don't know. I've been around these discussions a lot I was on the board of directors of a business, which was basically a food hub back in 2006, and we operated for about half a year and then went bankrupt. We just couldn't do enough sales there was just too much overhead and too little market."-Farmer C

A similar story was shared by a farmer who had been working with a small business owner who was picking up produce from the farm and was selling to restaurants in Halifax out of her car. Although the farmer did not know many details, what she did know was that after some time, the owner went into debt and the business went under.

4.3.3 Cooperation Among Farmers

The theme of prior failed food distribution businesses in Nova Scotia, feeds into the theme of farmer cooperation. Nova Scotia has a long history of farmer cooperatives, which are private organizations owned and led by producers of a particular commodity (McBride, 1986). Agricultural cooperatives help producers achieve the volume of product needed to gain market power through jointly marketing and processing their produce (McBride, 1986). Interview participants shared their positive and negative experiences of working together cooperatively, and include:

"I would say farmers notoriously like to do things their own way and I think that's why farmer co-ops still work. They farm because they want to do things how they want to do them and they're pretty self-reliant, independent individuals. I think one of the things we really focus on in the co-op is this really intense relationship building so that the foundation for relationships is very strong for when conflicts arise." -Farmer E

"One of the biggest challenges is that as small business operators, as farmers we all run our own business, we're all captains of a ship, our own little ship. Now you put us around a table and now we're collaborating on running a business model that has a mission, but there's a certain amount of ego and dynamics that play out, and at certain point, being that we're handling money and resources there are decisions that are made that may benefit this particular person and maybe

actually cost another person."-Farmer C

The farm-to-school program representative interviewed in Nova Scotia's South Shore has encouraged local farmers to organize themselves so that they can achieve the volume needed to supply the schools involved in the program. The farmers they have spoken to are interested in supplying the schools, but there is an overall lack of organization amongst the farmers in the region to achieve this ongoing request. This interview participant expressed her frustration over this challenge in the quotation below:

"There's a history and I'm sure you've probably heard this in other communities, of farmers not getting along and not working together. I don't think a hub is going to fly unless they work through all that stuff. So, if they don't ever deal with the conflict between them, or whatever it is between them that stops them from doing other things, somebody else can't organize that or take care of that. They have to figure it out."-Farm-to-School Program Representative

4.3.4 Ease of Access to Local Produce

Each interview participant representing the retail end of the supply chain, stated that they do not find it difficult to obtain locally sourced food. They have all found farms that will wholesale to them, and will deliver to their restaurant directly, or allow the owner to pick up their order at Halifax Seaport Farmer's Market. Some retail participants have found a local distribution company that fits their particular needs. In both scenarios, the retail participants voiced the significance of building and maintaining a respectful and trusting relationship when working with farms and vendors. Some examples include the direct quotes below:

"We are lucky that we have a really strong network of people that we had established, so we knew a lot of farmers already. I would say that when you first open if you're a brand-new chef or a brand-new restaurant and you didn't have any relationship with people in Nova Scotia, finding suppliers might be difficult for a week or two or maybe a month until you find what you're looking for. But most of them deliver, they're easy to access. They operate as a wholesaler so you can just

call in your order and it's there for you to pick up or it's delivered to you. So, it's really all about calling like six people, it's not a huge deal and it's also good to have specialization as far as someone on the other end of the phone. You don't want to talk to someone on the phone who just does the ordering." -Restaurateur A

"Yeah right now we are getting our local food from a local distributor for produce. So, I feellike our produce is kind of being met through them. They have been there for a long time and that would be maybe be unethical to just pull away from them, and if they're fulfilling the goal of purchasing local then that's kind of what's important." -University Food Service Nutritionist

Amongst those interviewed, the most successful relationship appears to exist between the retail participants and local farmers. Due to the fact that cold hardy crops grow and store well in Nova Scotia, farmers can consistently supply grocery stores with local food throughout the colder months and maintain strong working relationships with these regional retail vendors. An example quotation from a retail vendor that illustrates this is:

"Actually, from a produce perspective we are quite well served here in Atlantic Canada, so I would use apples for example, we grow enough apples to have over a year supply, carrots and onions, potatoes, turnips and cabbage would all fall under our basic storage crops. Parsnips and broccoli are something that we can get 7 maybe 8 months out of the year, so yeah know, we do have to buy certain products from the U.S. after our season has ended and our customers won't for example, accept the fact that they have to wait 4 months for cauliflower, they want it every day regardless of where it's coming from. So, when the cauliflower crop is exhausted here we set to buy from the U.S."-Grocery Store Representative

4.3.5 Local Meat Suppliers

The lack of federally inspected slaughterhouse or abattoir for cattle in Nova Scotia and throughout the Maritime provinces has made it difficult for the meat industry to sustain themselves. Grocery stores are unable to purchase locally produced meat at the volume they need, and as one cattle farmer explained in the quotations provided below, he cannot sustain his business through the local retail sector due to a lack of infrastructure in the province to support the beef sector.

"Any protein in Atlantic Canada is quite difficult. We don't have much in the way of processing facilities and that's yeah know, I don't know what the answer is for that one. We have one beef company--they have an abattoir on the island but they cannot supply us, they can't even come close to our requirement. So, I mean they can supply the island but you add in the 80 odd stores they just can't do it. Produce is the best one. We have a few small vendors who supply us with sausages and meatballs and things like that, but to get into the actual beef production there aren't any facilities here in the Maritimes, and all of our beef and pork that we do raise and that we are able to sell would literally go to Quebec for processing and then back, and that's the result of nothing that the retail has had to do with it, it's the processing industry that have got literally a monopoly on pork production, on poultry production, and on beef production. That's a challenge for all of us here in the Maritimes."-Farmer E

"But you could go to a lot of farmers and we'll all say the same thing and that's that we love to raise the product, we just don't love selling it. But I think the truth of the matter is that people are going to have to sell it, or organize our businesses, so that someone's selling for us. Because we're just losing too much money to the retail sector. If you could boil everything down, the retail sector is getting 40 or 50 cents of that dollar and we need to get more of that." -Farmer E

Unlike the beef industry, the lamb industry in Nova Scotia has a federally inspected abattoir. The founder of a lamb cooperative who was interviewed explained how a cooperative can be beneficial for farmers and an agricultural sector as a whole. As mentioned in the quote below, his lamb cooperative is an example of how farmers working together can be advantageous, as it can create more volume of product and provide an opportunity for farmers to break into the retail sector.

"We thought early on that there was quite a benefit to working together, so that's what we've been

trying to do ever since. I think that it was proven that it has worked, because if it was just individual farmers trying to sell their lamb, which there still are, but they're limited to where they can sell. They can only sell at the farmers market or to an individual customer, so the farmer is going to spend a lot more time marketing than if he were a part of a co-op where all of that is done for him, he could concentrate on producing the lamb." -Farmer F

4.3.6 The Challenge of Seasonality

Nova Scotia has a mid-temperate climate, and a fairly short growing season that limits the range of produce that can be grown outdoors. The most sought-after fruits and vegetables grow in the summer, while the colder months of the year yields root vegetables and hardier cold weather crops (ThinkFarm, 2013). Depending on the type of business that is looking to secure local produce, the changing seasons can create a challenge. This is especially challenging for both farmers and institutional buyers that do not have summer students—the months of peak produce production in Nova Scotia. The examples below illustrate what the institution representatives discussed in terms of the challenge of dealing with seasonal produce and how a hub could help store produce during the peak growing season for purchase and consumption later in the year.

"All the produce becomes available in the summertime but all of the schools are closed in the summertime, so we need a bit of a hub or a bit of a processing area that we can hold things. We had negotiated a really good deal on shell peas but we had no place to put them in the freezer so that became a barrier. So that's another thing we keep looking for partnerships around. Like would the community college consider, yeah know they are closed all summer long, would they consider us using their kitchen and their storage facility over the summer and then we would spread it out to the schools after the summer."-Farm-to-School Representative

"Nova Scotia only grows so much during our growing season. I think the only thing that grows during the winter is like cabbage and potatoes. So, I think we buy everything that is grown here. And that's kind of where we've hit the wall is like 'well, it's just not available.'- University Food Service Nutritionist

Surprisingly, the seasonality of produce in the province was only brought up by those interviewed on the retailer end of the supply chain. Most restaurants said they will often supplement with vegetables from outside of Canada during the colder months, but one restaurant owner has built the seasonality into his business model. His quotation below expresses his passionate feelings about adhering to his personal ethos to buy local and support local farmers in his community who are also his friends, evening going so far as to eliminate tomatoes from one of his menus as they can be difficult to obtain locally.

"Ultimately, we drop back to the notion that if you can get it here then get it here. So, one of the things that has always been part of this thinking was that our burger restaurant never uses tomatoes. Tomatoes are a very difficult item to have produced here specifically and some of the tomatoes that are produced here are more specialized in the sense that a lot of producers that do produce tomatoes in this region tend to go with cherry tomatoes instead of off the vine. So, we decided that instead of trying to source these things or have tomatoes on our burger menu year-round, we just dispense with the whole notion of having tomatoes on the menu.". -Restaurant C

4.3.7 Season Extension Techniques

For some restaurant owners, as well as the grocery store representative, there appeared to be more frustration around the lack of varied produce during the winter months, as well as the lack of infrastructure, like greenhouses. The need for investment in greenhouses and other season extension techniques to supply the province with more food throughout the year was a commonly expressed issue amongst retail business representatives. Below are some quotations that provide examples of what was discussed:

"In the Maritimes all this technology is available but to be totally honest with you there aren't any suppliers that are really, I guess kind of stepping up and building greenhouses to the extent that they could supply us in the winter time. Now I will say that there's lots of talk out there, I am working with a bunch of vendors, I've had some vendors in Newfoundland, some vendors on the

Island, and vendors in Nova Scotia that do want to work on that, they recognize that the technology is becoming better. But there still needs to be an investment on the part of the farmer, in conjunction with the Department of Agriculture to bring those situations to bare. It's in our interest to support those businesses and when they get online we are going to be the first ones knocking on their door."-Grocery Store Representative

"In the winter nothing is growing here. I talked to some farmers, they don't have the money, the cash flow to even when they have a greenhouse that might be good for end of season and start of the season, but for winter most of them don't have the cash flow to get them the energy to warm them or keep them at certain temperatures so for that." -Restaurant B

4.3.8 Opportunities for Farmers

Surprisingly for farmers, the seasonal nature of produce was never mentioned as a barrier for their business, and only one farm amongst those that were interviewed had purchased a new greenhouse through a government grant in order to supply greens in early spring. Rather than focus on season extension techniques, there was more discussion from producers regarding access to cold storage and light food processing in order to ramp up supply throughout the year.

"What I'm really more interested in is serving our institutions, like our local university or the pre-school my daughter goes to, is looking to open their cafeteria to start sourcing local food. So, if we can have accounts like that where we are looking more at institutions and supplying them their produce for their kitchens."-Farmer E

The desire expressed by Farmer E mirrors a finding reported in the most recent U.S. National Food Hub Survey, where more than 70% of respondents said that they plan to enter or expand their business in the K-12 and University food service setting (Bielaczyc et al., 2019).

"If it's something that's value added like chopped up or diced, then we're not set up to do that, and of course more of the food service is going towards value added, chopped or diced."-Farmer D

For institutions, lightly processed vegetables can save time, money and storage space, as the respondent from the university sector described:

"Processed goods like cut carrots that have already been sliced, because we can't really afford to pay our staff to sit there and cut carrots, or peel potatoes. So, what if a local food hub also sold processed kind of food?" -University Food Service Nutritionist

However, as one farmer pointed out, light processing can often be a challenge for farmers as it requires additional food safety certification in Canada, as well as access to a commercial kitchen.

4.3.9 Using Local Food as a Marketing Tool

Restaurants, institutions, and grocery stores each have their own motivations for purchasing local food. Each business owner or institution chooses whether or not they promote their support of local producers. As illustrated in the quotations below, the restaurant owners interviewed in this study assert that their motivation for purchasing local food is built into their business ethos and they do not find that it needs to be advertised. Instead, they prefer customers frequenting their establishment because they simply enjoy the food, not just because they source locally.

"It's not something we advertise. We just do it because that's a belief we have as a restaurant, so it's not like we're satisfying a demand necessarily because people aren't coming here because we have local food, we choose to have local food."-Restauranteur A

"We don't like to pound out that whole notion of local sourcing, because it became a big deal and then you started to see it also being used as a green washing tool as well. So, we tend to pull back

on advertising it on our website but we do mention it and we certainly repost information and articles and things that deal with local sourcing issues and food sovereignty and all of the different aspects of food production. We are proactive on that end of things and we are proactive in educating the customer at the table."-Restauranteur C

"We don't like the process of writing things on the menu. All servers are trained to explain every dish and they need to know that. We don't want to lose that, it's nice to go in a place where you can still communicate with your server and understand that they have the knowledge as well."-Restauranteur B

Yet, for a large chain grocery store, like the one at which a participant represented in this study is employed, advertising locally sourced food is paramount. The aim of this grocery chain in particular, is to inform their customers that they are working hard to secure locally produced food while securing affordable prices.

"We call it local whenever we get a chance to, we advertise it in our flyers, we generally put a face to the business name. We're constantly updating that and putting it in our flyers, regardless of what time of year it is. And we're constantly talking positively about the local economies here in the province, the government is on our side, we have a good repour with the Nova Scotia government. But, it's a tough sell, it's a really tough sell. The people who go to a farmer's market and buy product that we sell in our stores pay twice the amount for it at the farmer's market. I know that farmer's markets are part of our communities, they're part of our way of life, this whole buy local movement is taking on a life of its own and it's almost like some of these people who go to farmers markets, shame people who go to grocery stores. But, if I could say it this way, go down to the farmer's market and observe the customers who are in that market and tell me which income demographic they come from. So, at the end of the day, they cater to a high-end income demographic. A grocery store has to be all things to all people, all the time." -Regional Grocery Store Representative

4.4 Perceived Benefits and Barriers to a Food Hub in Nova Scotia

Each interview participant was provided with a definition and description of a food hub, followed by semi-structured questions relating to what each participant felt would be the potential benefits and barriers of a food hub in Nova Scotia. Table 9 and Table 10 summarize the findings from the interviews with producers and retailers, respectively, within Nova Scotia's local food supply chain.

Table 9

Perceived Benefits and Perceived Barriers to a Food Hub from the Nova Scotia Primary Producer Perspective

Perceived Benefits	Perceived Barriers
• Not having to deliver product • A "new" way to sell product • Established customer base • Ability to reach larger markets • Marketing of product • A way to sell excess product	• Prefer to sell directly to customer • Satisfied with established methods of selling • Prefer face-to-face interaction with customers • Negative past experience when wholesaling • Preference towards low risk/low stress market channels • Do not like pre-promising crops • Prefer to be in control of business decision making • Not enough demand

Table 10

Perceived Benefits and Perceived Barriers to a Food Hub from the Nova Scotia Retail Perspective

Perceived Benefits	Perceived Barriers
• Storage capacity • Freezing/preserving of peak season produce • Potential for light food processing • Ability to access large volume of local food	• Poor management • Lack of product knowledge • Seasonality/product availability • Pricing • Quality • Volume • Not willing to impede on established supplier relationships • Satisfied with current method of procurement • GAP certification/food safety • Logistical complications in merging food hub with current supply chain • Similar business models have failed in the region

4.4.1 Do the Barriers Outweigh the Benefits?

This chapter outlined the results of semi-structured interviews with both primary producers in Nova Scotia's local food system and the likely end-users of a potential food hub in the province.

Ultimately, the results illustrate that there are generally more negative attitudes around the proposed idea of establishing a food hub in Nova Scotia, than positive attitudes and as I've reflected in Figure 9.

Figure 9

Benefits and Barriers

"It's just very competitive, very narrow profit margins and I just don't see the volume here now. For a Food Hub I think you'd have to have my guess, 1 million dollars minimum in sales. Which really isn't that much, but here it's a lot."-Farmer A

"A hub in my mind if they could deliver, that would help us a great, great deal because at this point we are spending time and money picking stuff up. I just think it would make it way easier for us to be able to offer the local."
-Farm-to-School Program Representative

The primary producers interviewed prefer to run their business in their own way, and are hesitant to use a local food wholesaler. Instead it is preferred to have total control of their business, including what they grow and in what quantities, how to sell their product, and how they earn a profit. On the retail end of the supply chain, most of the interview participants felt that they are already able to access local food in Nova Scotia even without the presence of a more structured system like a food hub. Given the abundance of seasonal availability of produce inand existing points of selling like local farm and farmer's markets, retailers are willing to make the effort to find desired local goods. The following chapter will provide a more comprehensive discussion of these findings.

Chapter 5

Discussion

5.1 Study Design

This research took place in Nova Scotia, Canada which is predominantly rural, with 60% of residents residing in non-urban areas (Statistics Canada, 2016). Many areas of the province are made up of communities where agriculture is embedded in their way of life (NSFA, 2010). From 2011 to 2016 the Canadian Census of agriculture documented a 10.9% decline in the number of farms in the province (Statistics Canada, 2016). Yet across North America and Canada, there is growing consumer demand for local food, with 42.5% of Canadians who were surveyed stating locally produced food is extremely or very important to them (The Conference Board of Canada, 2013). Among the many goals put forth for economic growth by the Nova Scotia Commission on Building Our New Economy, Goal 16 states: The value of agricultural products produced for, and consumed within, the Nova Scotia domestic market will have doubled, with the current value being approximately $230 million (Ivany et al. 2014). This report along with statements from the NSFA (2010), highlight the opportunities and growth that local agriculture can provide to the provincial economy. Similarly, food hubs can provide a way to aid and benefit small farms and the local food economy. The overall goal of this study was to identify if a food hub would be a viable business model in Nova Scotia, Canada. More specifically, this research was designed to understand the barriers that may prevent a food hub from being a viable option within the province, as well as the potential benefits it could provide to the local food system. The following research questions were used to guide the research:

In order to answer the research questions, semi-structured interviews were conducted with seven small farmers, three restaurant owners, two institutional representatives, and one representative from a regional chain grocery store. Each individual interviewed for this research plays an integral part in Nova Scotia's local food supply chain, representing either the primary producer or the retailer perspective on whether or not a food hub could be a viable option for the province. To summarize, the results of this research suggest that the perceived barriers to the establishment of a food hub outweigh the potential benefits a hub could provide to the province.

5.2 Key Take Away

Ultimately, this research found that a food hub may not be a viable option for Nova Scotia. Interview participants flagged more barriers that could prevent a food hub from being successful in the province, as opposed to positive feelings about the benefits and opportunities of such an establishment.

5.2.1 Drawing Conclusions from Primary Producers

Interviews with primary producers helped to understand what some of the more common business challenges are for small farmer operators in Nova Scotia. These conversations also provided insight as to the potential opportunities and barriers that are present within the local food system.

Farmers were asked to discuss their point of view on the viability of a food hub in the province, all of which helped to answer the primary research questions.

5.2.2 Produce Farmers

Each produce farmer interviewed had either been disappointed by their previous involvement with failed local food wholesalers or they had specific caveats that they brought up when asked about a hypothetical food hub in Nova Scotia. It was found that small farmers in particular are usually quite intentional with their business decisions and like to have a say in how and to whom they sell their product to. The information is somewhat contradictory—on the one hand, farmers stated that they prefer to have control over how they sell, with many enjoying the DTC model. On the other hand, there was also interest in diversifying sales strategy, but with specific caveats in place. Though this research is not representative of all farmers within Nova Scotia, a hub needs to have a certain level of buy-in from local farmers before even opening the business, therefore the interview findings provide valuable insight (Barham et al., 2017). In addition, having a well-designed business model that estimates how many farm partners would be needed in order for the hub to supply customers is highly recommended (Barham et al., 2017). Drawing excitement for and having farmers sign on as partners to the hub is also imperative. Schmit and Severson (2019), suggest that a hub may want to collaborate with growers to create a pre-season plan and be able to expect and forecast supply for buyers. However, this research has shed light on the fact that small farmers in Nova Scotia may not be comfortable with pre-promising crops before the season has started. The current literature on food hubs fails to address the success or plight of hubs from the producer perspective. In fact, in analyzing a large majority of research that exists on food hubs, I have yet to find a piece of literature that examines food hubs from the producer perspective. When farmers are discussed within the existing literature it is in the context of faircommodity type, or production volumes. That said, the majority of available literature is also focused on feasibility assessments and case studies, with analysis on existing hubs with a main focus on business practices and financial viability.

5.2.3 Livestock Farmers

Roughly 91% of food hubs in the U.S. choose to focus their efforts on selling produce, while 63% of hubs also provide meat options to their customers (Bielaczyc et al., 2019). It was important within this research to include representation from Nova Scotia's meat industry. The two livestock farmers who were part of this research come from the beef and lamb industry—commodity groups that have differing history. Similar to many food hub models, the lamb cooperative provides an example of what can be achieved when farmers work cooperatively together. The cooperative markets their lamb under one name and it is distributed from a centrally located facility, allowing the business to gain access into regional grocery stores throughout the Maritimes. Within Canada, there are both provincial and federal abattoirs—meat processed at a provincially inspected abattoir can only sell the product within the province, whereas meat processed at a federal facility can be sold throughout Canada and beyond (Sooksom, 2010). The lamb cooperative owns and operates a federally inspected abattoir which allows them to supply lamb within the Maritime region and has helped to strengthen the provincial and regional sheep farming industry (Jones, n.d.). The only federally inspected beef abattoir in the Maritimes is located on Prince Edward Island (P.E.I). This presents a challenge for beef farmers in Nova Scotia who want to ship cattle P.E.I. for slaughter, as there is added cost to ship cattle to the island. Provincially inspected beef abattoirs exist throughout Nova Scotia, but the demand has not necessarily been stable for some beef farmers, including the one farmer interviewed as part of this research. The lamb cooperative already wholesales and has gained a foothold into the retail market within the Maritimes, so the owner did not see how a food hub could be beneficial to his business. On the other hand, the beef farmer interviewed displayed a lot of positivity toward the food hub concept, noting its potential benefits to the beef sector within the province. He feels the industry needs more help marketing provincially raised beef. He was mostly interested in stronger marketing, DTC sales, and providing online purchasing options for customers. In his experience, selling DTC within the province was simply not sustainable for his business as there was not enough demand. Ultimately, he had chosen to begin sending his cattle to be auctioned off in Quebec, where he could make more profit.

5.3 Implications of External Factors

There are many variables in a given area that may have an effect on a food system, the local economy, and local businesses. The population, age and cultural demographics, median household income, geography and climate can all significantly influence the local food system (Giovannucci et al., 2010). These factors must be considered when assessing the viability of a food hub in order for there to be long-term sustainability for the business (Matson, 2017). These are often variables that are out of the control of the business, but must be factored into the business plan. The data that exists on failed food hubs points to examples of hubs that have not fully taken these factors into consideration. For Nova Scotia in particular, external factors that exist may be a legitimate barrier to a food hub's success, scalability and long-term viability.

5.3.1 Retailer Access to Locally Produced Food

A key consideration when opening a new business is understanding what similar businesses exist in the region that may present competition (Bressler, 2012). With the exception of the farm-to-school program representative who was interviewed as part of this study, the other five retail representative interviewees felt comfortable with how they were obtaining locally produced food. Each retail business either had a secure network or felt comfortable with their local wholesale business relationships. This could present a challenge for a food hub that is setup as a wholesale model, as securing new partnerships with existing retailers in the region would be vital for the business. The results of this research suggest retail business owners may not feel comfortable parting ways with farmers that they have relationships with. Nova Scotia is a small, inter-connected community, where businesses appreciate long standing relationships and may not be willing to pivot to a new supplier. In fact, four out of six retail representatives interviewed in this study said they would not feel comfortable leaving their supplier because they have developed into strong friendships and partnerships. This suggests that even if a superior vendor like a food hub exists, a retailer may be reluctant to abandon established vendor relationships.

5.3.2 Geographic Proximity

The main purpose of a food hub is to take the burden of sales, marketing, distribution, and customer acquisition off of farmers, who often spend much time off of the farm at markets (Barham, 2012). Food hubs are built to allow the farmers to focus on producing, while the hubs leverage the selling opportunities the farmer may not have been able to achieve on their own (Barham, 2012). When establishing any type of brick and mortar business, a major factor in the success of the business is the location and the socioeconomics of the area (Bressler, 2012). Not unlike any other business, in order for a food hub to succeed there has to be enough supply and demand for the product(s) being sold (Barham, 2017). The National Food Hub Survey (Bielaczyc et al., 2019) along with Schmit and Severson, 2019, identified that two of the major challenges for existing food hubs are maintaining sufficient quantities of product that can be sold at competitive price, in addition to balancing supply and demand.

The overall size and population of Nova Scotia also presents a potential challenge for a food hub. The size of the province is 52, 942 square kilometers, with a current population of 979, 351 (Government of Nova Scotia, 2020; Statistics Canada, 2016). The capital of Nova Scotia is Halifax, which is the only major urban center in the province with a population of 440, 332 (Statistics Canada, 2021). Comparatively, the data that exists on some of the most successful U.S. food hubs service densely populated metropolitan areas. Red Tomato, for example, is located in Providence, Rhode Island, servicing urban areas such as Boston, Massachusetts and Philadelphia, Pennsylvania. The non-profit's success, is due in part to their location, which provides them access to densely populated areas, with high annual-incomes. As of 2013 their team of six had made $3.75 million in sales (Matson et al., 2015). In his post-mortem report written to understand how and why a number of food hubs in the US failed, Barham et al. (2017) found that one hub being studied was forced to close because they simply could not keep up with their transportation costs. The hub was spending too much time picking up small orders from farms that were a considerable distance away. In Nova Scotia, the most fertile agricultural region is the Annapolis Valley, located approximately 100 kms outside of the city of Halifax. The distance to farms and the frequency spent picking up orders is an important consideration and challenge for a food hub. Beyond the Annapolis Valley there are farms located throughout Nova Scotia where some distance might have to be traveled to reach enough farms for the volume that might be needed to supply customers.

5.3.3 Seasonality

Understanding consumer buying patterns is cited as an important lesson learned for food hubs, especially in areas where produce is seasonal (Matson, 2017). The existing literature has found that seasonality of produce is a challenge for many hubs, and the results of this research point to the fact that this is a potential barrier within Nova Scotia, where there is a fairly short peak growing season. Producers that were interviewed stated that they are unable to supply large amounts of produce throughout the winter and do not feel comfortable promising a set amount of produce before it is grown and harvested. This presents a significant challenge for food hubs that are selling not only to consumers, but also to larger institutions. Although a food hub aggregates supply from many producers in order to increase volume, failed food hubs were simply not able to provide the large volume of consistent, pre-cut, and packaged produce, year-round that larger institutional or grocery customers for example, may demand (Bielecyz et al., 2019). Consistent with existing literature, this concern of food hubs not supplying enough product was also communicated by both of the institutional representatives interviewed, as they require a high volume of product and consistency. For hubs that are supplying directly to customers or even to retailers like traditional grocery stores, understanding consumer trends is key to success. Barham's (2017) study provides a poignant example of a failed hub that served the Washington D.C. metro area and was able to secure more supply in the peak summer produce season, but found that consumers preferred to shop at farmers markets during this time of year rather than through the hub, which had a detrimental effect on the business (Barham, 2017).

5.4 Financial Barriers

As with any start-up business, there is risk involved, as not every venture will achieve competitive advantage or be financially viable (Bressler, 2012). A USDA assessment of operational food hubs within the U.S. found that from 2005 to 2011, there was an 88 percent success rate amongst food hubs, while a typical new business has a survival rate of 53 percent within the same time period (Barham et al., 2017). That being said, food hubs are still very difficult businesses to operate, and much of the research available examines hubs that have not been in business for very long, meaning they may have yet to encounter major challenges or may still be obtaining outside funding to support the business model (Bressler, 2012). The takeaways from the Barham's (2017) post-mortem report, aligns with some of the major themes that emerged from this research, examples of which include:

- The fresh food distribution business is not an easy one, and food hubs are not immune to many of the challenges that are present in the fresh food sector. Product is perishable, overhead costs (primarily from storage and transport costs) and the profit margins within the industry are narrow.
- Successful fresh food businesses generally rely on volume in order to achieve profitability, meaning they are selling very large quantities of food, and have a large customer base.

The hesitancy presented by interviewees when faced with questions about a potential food hub within the province aligns broadly with findings in the larger food hub literature, as multiple studies on hubs show how difficult it can be to run this type of business (Bressler, 2012; Barham, 2017; Rysin & Dunning, 2016). Food hubs can be set up in a variety of models including for-profit, non-profit, or cooperatively led. In any case, a food hub is a business and therefore needs to be financially viable in order to be successful in the long-term (Barham, 2017).

Two of the leading researchers in understanding food hub viability, Matson and Barham (2017), state that above all, a food hub should follow their concept of the "Oxygen Mask of Financial Viability" —meaning that a hub should secure and worry about their own finances and ensure they have enough oxygen, before moving on to provide their mission-driven initiatives to the local community. The evidence from Matson and Barham (2017), explains that the chances for a food hub to reach financial viability is dependent on specific external and internal factors, and can be difficult to achieve without the right business acumen. For a province like Nova Scotia, the external factors such as supply and demand could make it difficult for a hub to reach financial viability within the province, as well as maintain a successful self-sustaining business.

5.5 Study Limitations

The design of this study had its limitations, some of which were methodological and others were researcher-based. It is important to note that these limitations may have had an effect on the overall generalizability and reliability of this research and should be factored into the results of this study. The methodological limitations that must be addressed in this research are related to lack of previous research, time constraints, and issues with sample size and data collection. These limitations all had a direct effect on one another and the findings of this study must be seen in light of them.

5.5.2 Limited Literature

When setting out to conduct research, it is common practice to examine and review the existing literature on the topic (Mertens, 2020). This helps the researcher understand the topic of choice including the theoretical foundations of previous research on the subject, and it also helps to identify gaps in the literature (Mertens, 2020). For this study topic, the existing literature that is available on food hubs in North America is quite limited mainly because hubs are a recent concept—on average, a food hub within the U.S. has been in business for 11 years (Bielaczyc et al., 2019). Within the Canadian context, the number of food hubs that exist within the country is unknown and there is very limited literature on the topic within the country. Much of the literature on food hubs within Canada are in the form of independent feasibility studies conducted by consultants working for a specific company or NGO. There is a larger amount of research that has come from the U.S. most likely due to the fact that the USDA is driving and supporting a majority of the efforts around food hubs and their research, in collaboration with universities across the country. However, because this is a new type of business that has only recently begun to be studied within the last 10 years or so, the majority of publications examining food hubs are in the form of case and feasibility studies. Conducting research on a topic that is still new, proved to be a limitation in itself, as there was no set of best practices, methodologies, or theoretical framework to follow. Although both case and feasibility are most prevalent within the existing literature, it did not provide guidance for the design of this research, seeing as there was not yet a food hub in the province at the time that this research took place. Although this research was not designed as a feasibility study, such literature did serve as a helpful framework and general guide.

Even within the existing case studies on food hubs, there remains a gap in the literature which is including producer viewpoint in these studies and analyses. Rather, each case study examines an existing hub, and only provides insight from the operator's perspective. The studies typically include information on the types of primary producers they work with, as well as the common payment structure and system with farmers. Similarly, when examining food hub feasibility studies, the analysis is typically focused on overall agricultural trends in the region of interest, as well as the local economy. Understanding producer motivations, apprehensions, and overall experiences with a food hub would undoubtedly provide a valuable point-of-view and help create a well-rounded body of literature within this field of study.

5.5.3 Time Limitations

This study was designed and carried out in order to satisfy the requirements for a Masters of Environmental Studies degree. Therefore, time was a constraint throughout most of the planning, data collection, and analysis phase of this research. Additional time would have allowed for securing additional interview participants, as well as time to travel to locations that were further away, in order to gather information from a wider geographic radius. In addition, second round interviews to collect more information during or after the data analysis period may have provided deeper and more comprehensive insights.

The data collection phase fell within the summer months, which is the busiest season for farmers as it is the peak produce season. For restaurant owners, summer is also a busy time of year due to tourists visiting the Halifax area. This made it difficult to secure sufficient time to sit down with interview participants. As a result, interviews were either held over the phone, or they were pushed to the fall months when the data analysis period was set to begin. Phone interviews, as well as physical interviews that are squeezed in during a busy work day, may not have provided the quality of data that is sought after.

5.5.4 Sample Size

Gathering an appropriate and diversified sample size was a major challenge for this study. As an outsider to Nova Scotia's agricultural community, gathering the appropriate contacts to secure interview participants within a specific time frame proved to be challenging. Although it was vital that farmers be interviewed, it may have been beneficial to have equal sample sizes for each group (farmers, retail representatives, etc.). When reflecting back on the data collection period, there may have been an over emphasis on farm operator's participation and not enough emphasis on retail representative's involvement. Ultimately, the time constraint led to a smaller, less diversified sample, and there was richer data collected from the farmer population. These constraints may have had an effect on the generalizability of this research.

5.5.5 Position as a Novice Researcher

A very realistic limitation to this research is that I, myself, am a novice researcher and there are inherent limitations that exist because of my skill level and inexperience (Jatin et al., 2018). Each step of the research was conducted under the supervision of multiple supervisors, and relevant coursework was taken to learn about study design, implementation and the general field of interest. However, being a researcher is certainly a skill that becomes fine-tuned through experience and is refined over time. As a novice researcher, I was most challenged during the data collection stages of this study as interviewing others did not come naturally to me. This challenge may have affected the overall comfort level during the conversation with interview participants and potentially interfered with the quality of data obtained.

5.6 The Opening of a Food Hub in Nova Scotia

Shortly after data was collected for this research, a food hub called the Station Food Hub: Food and Beverage Innovation Centre opened in Nova Scotia beginning in 2018. The business is located in an old primary school in Newport Station, Nova Scotia, which is set between the Annapolis Valley Region and Halifax. It is unknown whether a feasibility study was first conducted before the hub was opened, but funding was provided through investment from FarmWorks, a local agriculture investment company in the province. According to their website, the hub provides rentable commercial kitchen space to local business owners in order to provide value-added and lightly processed foods to local customers and institutional partners. An additional mission-oriented service of the hub is to provide mentorship for small food business owners.

5.7 Opportunities and Barriers for Local Food in Nova Scotia

This research suggests that the current state of how local food moves through the supply chain in Nova Scotia seems to be sustaining itself, with more than half of retail representatives vocalizing that they feel that they are well served by local farms and distributors. A key finding is the interest from both farmers and institution representatives on the opportunity to expand supply to schools, hospitals, and long-term care facilities. Across North America, many institutions, especially schools, are beginning to implement policies to begin supplying, at least a portion of their food from local sources Nieblyski et al., 2014). The 2019 National Food Hub Survey states that collaborating with institutions is the major focus for the majority of hubs surveyed (Bielecyz et al., 2019). This push for institutions to adopt local food buying practices is not new, as farm-to-school programs have been gaining traction in recent years. It does appear that food hubs are realizing that this may be a new market to expand into (Bielecyz et al., 2019). Even still, there are many barriers in place for food hubs when trying to establish buy-in from institutional stakeholders like primary schools. Not only do institutions have to favor buying local over saving money, but food hubs also have to become the preferred vendor of the institution which can be difficult to achieve (Barham, 2017; Bielaczyc et al., 2019). It was found that 45% of respondents from the 2019 National Food Hub Survey feel that meeting institutional buying requirements was either the first or second largest barrier to growth to expansion into this market (Bielaczyc et al., 2019). In parallel with the existing literature, the two interview participants from this research who represented academic institutions, felt that a primary challenge to obtaining local food is that peak summer produce is available when school is not in session. This continues to be a major challenge for food hubs as well, with more than half of the National Food Hub Survey respondents citing seasonality as another major barrier to the institutional market (Bielaczyc et al., 2019).

5.8 Recommendations for Further Research

This research provides a launching point for future research that may help to further understand the complexities of Nova Scotia's local food system. Based on this study, recommendations for future research into the provincial food economy include:

- *Assessing small farm financials: How profitable are small farms in Nova Scotia?*
- *Survey and interviews to further assess institutional interest in purchasing local food*
- *Assessment of DTC demand for local food in Nova Scotia: What are consumer's preferred purchasing methods?*
- *Is the local food market in Nova Scotia saturated?*
- *Is there an unmet demand for local food that a food hub would be providing to the community?*
- *Examine the challenges that are present within Nova Scotia that may prevent farmersfrom working together cooperatively*

In relation to the food hub topic, further research would help push this baseline data further. Particularly the following questions may help assess the feasibility of a food hub in Nova Scotia that wholesales directly to large, institutional accounts. The suggestions for guiding research questions include:

- *What volume of product would be needed for a hub to be financially viable in Nova Scotia?*
- *What level of institutional interest throughout Nova Scotia would be needed for a wholesale food hub model to be successful?*

In addition, examining and conducting a case study analysis on the food hub that opened in the province in 2018 could yield interesting information on the scale and long-term viability of the business model. It is also recommended that in-depth research be conducted on what impacts COVID-19 had on Nova Scotia's food system and what the long-term implications might mean.

5.9 Contributions to the Literature

On a broad-scale, this research compiles a comprehensive analysis of data from the existing body of literature on food hubs, as well as geographically specific data that provides insight into Nova Scotia's local food system. Although a hub now exists in the province, this research may help provide guidance to the business as they progress. From a broader perspective, this research has added to the sparse body of literature that is present on food hubs within Canada, as the large majority of literature that does exist on the topic is heavily focused on case studies that assess existing or failed food hubs mainly within the U.S. Feasibility studies that do exist, have yet to focus on farmers or retail business owners, but rather on the overall regional food economy as a whole. I believe this is a failure on the part of the current research as strong partnership and collaboration with farmers and retail business owners is one of the most crucial elements needed for a food hub to be successful. This study addresses that gap within the literature by providing data through the perspective of farmers and representatives from the retail sector that has yet to be discussed. Although COVID-19 has changed our local food economies, this research will help to provide some baseline data on what the state of local agriculture was like before the pandemic, and research on Nova Scotia's food system post-pandemic may point to this study as a good comparison.

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APPENDICES

APPENDIX A: RESEARCH ETHICS BOARD APPROVAL

DALHOUSIE UNIVERSITY
Research Services

Social Sciences & Humanities Research Ethics BoardLetter of Approval

June 07, 2017

Candace Nicoletti
Management\Resource & Environmental Studies

Dear Candace,

REB #: 2017-4185
Project Title: Assessing the Viability of Food Hubs within the Nova Scotia Agricultural Supply Chain

Effective Date: June 06, 2017
Expiry Date: June 06, 2018

The Social Sciences & Humanities Research Ethics Board has reviewed your application for research involving humans and found the proposed research to be in accordance with the Tri-Council Policy Statement on *Ethical Conduct for Research Involving Humans.* This approval will be in effect for 12 months as indicated above. This approval is subject tothe conditions listed below which constitute your on-going responsibilities with respect to the ethical conduct of this research.

Sincerely,

Dr. Karen Beazley, Chair

Post REB Approval: On-going Responsibilities of Researcher

APPENDIX B: INTERVIEW GUIDE (Primary Producers)

1. Can you please describe your business to me?
    a. Describe the size of your farm operation? How many people do you employ?
    b. What do you produce?
    c. How much land is dedicated to each of these foods?
    d. What volume of product do you sell? How much is it worth?

2. Can you describe what product is most profitable and least profitable?

3. Is your farm currently operating at its maximum capacity?
    a. If no, why?

4. Who do you sell your products to?
    a. What form (if more than one) of selling is most successful?

5. In an ideal world, what way would you like to sell your products? And to whom? Wholesales/agent/retailers/consumers?

6. If you wanted to enter a new market, do you feel that you have the support to do so?

7. What forms of marketing do you use?

8. Is it important to you that consumers know that what they are eating comes from your farm?
    a. If yes, why?

9. Are you familiar with the concept of a Food Hub? (if no, researcher will explain)

10. Do you think your business could benefit from a Food Hub?
    a. If yes, why?
    b. If no, why?

11. Are there any specific barriers or issues you can think of that would stop you from using a Food Hub (If not answered in questions 11 (b))

Food Hub Concept Explanation:

(USDA Definition): A business or organization that actively manages the aggregation, distribution and marketing of source-identified food products primarily from local and regional producers to strengthen their ability to satisfy wholesale, retail and institutional demand.

A food hub may vary as they respond to the producers and needs specific to its region but all food hubs promote production growth, support small and mid-sized farms, and make local food accessible to larger markets.

Food hub functions vary but may include the following:
• Market access for local producers
• Information sharing
• Transportation and distribution;
• Brokerage services
• Product bundling and aggregation
• Season extension
• Maintaining producer-consumer connections
• Producer-oriented technical assistance

APPENDIX C: INTERVIEW GUIDE (Restaurant & Institution Representatives)

1. Can you please describe your business to me?
    - a. What volume of agricultural products do you order on a given week?
    - b. What food products are used most by your business?
    - c. What are the most popular food items on your menu?
    - d. How many employees do you have?

2. Does your business buy any locally produced food?

    - a. If yes, is that food obtained through a wholesaler or does it come directly from the farm?
    - b. If no, why?

3. Are you looking to add more locally produced food to your menu?

4. Do you label local food on your menu?
    - a. If yes, do you specify the exact farm on your menu

5. Is it difficult to obtain locally sources products?
    - a. If yes, why?

6. Are you satisfying the customer demand for local food?
    - a. If no, why?

7. Are you familiar with the concept of a Food Hub? (if no, researcher will explain)

8. Do you think your business could benefit from a Food Hub?
    - a. If yes, why?
    - b. If no, why?

9. Are there any specific barriers or issues you can think of that would stop you from using a Food Hub? (If not answered in 11 (b))

Food Hub Concept Explanation:
(USDA Definition): A business or organization that actively manages the aggregation, distribution and marketing of source-identified food products primarily from local and regional producers to strengthen their ability to satisfy wholesale, retail and institutional demand.

A food hub may vary as they respond to the producers and needs specific to its region but all food hubs promote production growth, support small and mid-sized farms, and make local food accessible to larger markets and stimulate economic growth.

Food hub functions vary but may include the following:

- Market access for local producers;
- Information sharing;
- Transportation and distribution;
- Brokerage services;
- Product bundling and aggregation;
- Season extension;
- Maintaining producer-consumer connections; and
- Producer-oriented technical assistance.

APPENDIX D: INTERVIEW GUIDE (Grocery Store Representative)

1. Tell about your business?
    a. What percentage of your store sales are in fresh produce and land-based protein?
    b. What are the highest volume selling agricultural products?
    c. What is your total sales revenue?
    d. How many employees work for your business?

2. Does your store buy any locally produced food?
    a. If yes, is that food obtained through a wholesaler or does it come directly from the farm?
    b. If no, why?

3. Approximately, what percentage of local food is obtained directly from a farm or through a wholesaler?

4. If you sell locally produced food, is it marketed it as local?

5. Do you find there is great consumer demand for locally sourced products?

6. Are you meeting demand customer demand for local food?

7. Is it difficult to obtain locally sourced products?
    a. If yes, why?

8. Are you familiar with the concept of a Food Hub? (if no, researcher will explain)

9. Do you think your business could benefit from a Food Hub?
    a. If yes, why?
    b. If no, why?

10. Are there any specific barriers or issues you can think of that would stop you from using a Food Hub? (If not answered in 11 (b))

Food Hub Concept Explanation:
(USDA Definition): A business or organization that actively manages the aggregation, distribution and marketing of source-identified food products primarily from local and regional producers to strengthen their ability to satisfy wholesale, retail and institutional demand.

A food hub may vary as they respond to the producers and needs specific to its region but all food hubs promote production growth, support small and mid-sized farms, and make local food accessible to larger markets and stimulate economic growth.

Food hub functions vary but may include the following:

- Market access for local producers;
- Information sharing;
- Transportation and distribution;
- Brokerage services;
- Product bundling and aggregation;
- Season extension;
- Maintaining producer-consumer connections; and
- Producer-oriented technical assistance.

APPENDIX E: CONSENT FORM

Project Title: Assessing the Viability of Food Hubs within the Nova Scotia Agricultural Supply Chain

Lead Researcher
Candace Nicoletti
Masters of Environmental Studies Candidate, 2018
School for Resource and Environmental Studies, Dalhousie University
Email: CNicoletti@dal.ca
Phone: (914) 330-3459

Dear Participant,

You are invited to participate in a study being conducted by Candace Nicoletti who is a Masters of Environmental Studies Candidate with the School for Resource and Environmental Studies at Dalhousie University. Participation in this study is completely voluntary. The following information will highlight: The purpose of the research; your involvement; and explain any potential benefits, risks, inconvenience or discomfort that you may experience. You are not obligated in any way to participate in this study, and you will not suffer any consequences should you choose to not participate in, or late withdraw from the study. Please feel free to ask the researcher any questions you may have, and/or express any concerns regarding your involvement prior to, during, or following the interview.

What is this project about?
The intent of this research is to investigate the viability of a Food Hub (a local food distribution center) within Nova Scotia's agri-food supply chain. The lead researcher is seeking information on the needs of the industry in relation to the buying and selling of locally produced food, as well as understanding what the level of interest in a Food Hub would be.

Who can take part in this study?
In order to participate in the study, you must be a Nova Scotia produce or beef farmer, or a retail store or restaurant within the Halifax Regional Municipality.
An estimated 15-20 participants are taking part in this study.

What will my involvement be?
Your involvement in this study is completely voluntary. You may choose to withdraw from the study up until two weeks after the interview. Your participation in this study will include a thirty-minute to an hour in-depth interview. Your interview will be audio recorded and transcribed. During the interview you will be asked questions about your business. You will also be asked question regarding your level of interest in the establishment of a Food Hub.

Who will have access to my recorded interview and interview transcript?
Information that you provide during your interview will be kept private. Only, the lead research, Ms. Candace Nicoletti will have access to the original audio-recorded interview and interview transcript. The audio recording and transcription will be kept in a secure location, in an encrypted file, on a password-protected work laptop, until the project is complete, at which time both the recordings and transcriptions will be destroyed.
All information collected for this study will be coded, analyzed, and compiled into a final Masters Thesis project in order to fulfill the requirements of the Master of Environmental Studies degree. There will be no individual identifying information included in the final report.

How will my confidentiality be protected?
Every effort will be made to protect your privacy and keep your participation in the study confidential. Ms. Candace Nicoletti has an obligation to keep all research information private. You will only be asked to provide your name and e-mail and/or phone number, which will be destroyed upon completion of the study in August 2018. Your name and any other potential identifying information will be omitted from all interview transcriptions and the final research report. A participant number or pseudonym will be given to your information to protect your identity. The corresponding list with your personal information will be kept in a separate encrypted file on a password-protected laptop, or in the case of paper documents, in a locked filing cabinet in a secure location. Any potential identifying information will be secured and separated from your interview data. There will be no identifying information included in the final report of this study.

Are there any benefits, risks, or discomfort associated with this research?
There are no known personal benefits; and the risks associated with participation in this study are minimal. There will be no personal compensation for participation in this study. You may experience discomfort about answering certain questions; if you feel uncomfortable then please do not hesitate to inform the researcher and they will move on to another question. In signing the consent form you do NOT waive any rights to legal recourse in the event of research-related harm.

How will findings from this study be shared?
All findings of this study, and final thesis will be available online through Dalhousie University's Library system. Some findings will also be submitted to two of the following journals for publication: The International Food and Agri-business Management Review, The Journal of International Food and Agri-business Marketing and the Canadian Journal of Agricultural Economics.

Who can I contact if I have a question?
Should you have any questions or concerns please feel free to contact:

Lead Researcher
Candace Nicoletti

Masters of Environmental Studies Candidate, 2018
School for Resource and Environmental Studies, Dalhousie University
Email: CNicoletti@dal.ca
Phone: (914) 330-3458

If you have any ethical concerns about your participation in this research, you may contact:
Research Ethics, Dalhousie Research Services
Email: ethics@dal.ca
Phone: (902) 494-3423

I have read and understood the above information regarding this research study (please check the boxes to indicate 'yes'):

- ☐ I understand that participation is voluntary and that I may withdraw from the study up until two weeks after the interview

- ☐ I have been given the opportunity to review the consent form, and ask any questions I may have about the research study

- ☐ I agree to participate in the research project and to have my interview audio-recorded o I understand that direct quotations of things I say may be used without identifying me

- ☐ I understand that in signing this consent form I do NOT waive any rights to legal recourse in the event of research related harm

______________________________________ _______________
Signature Date