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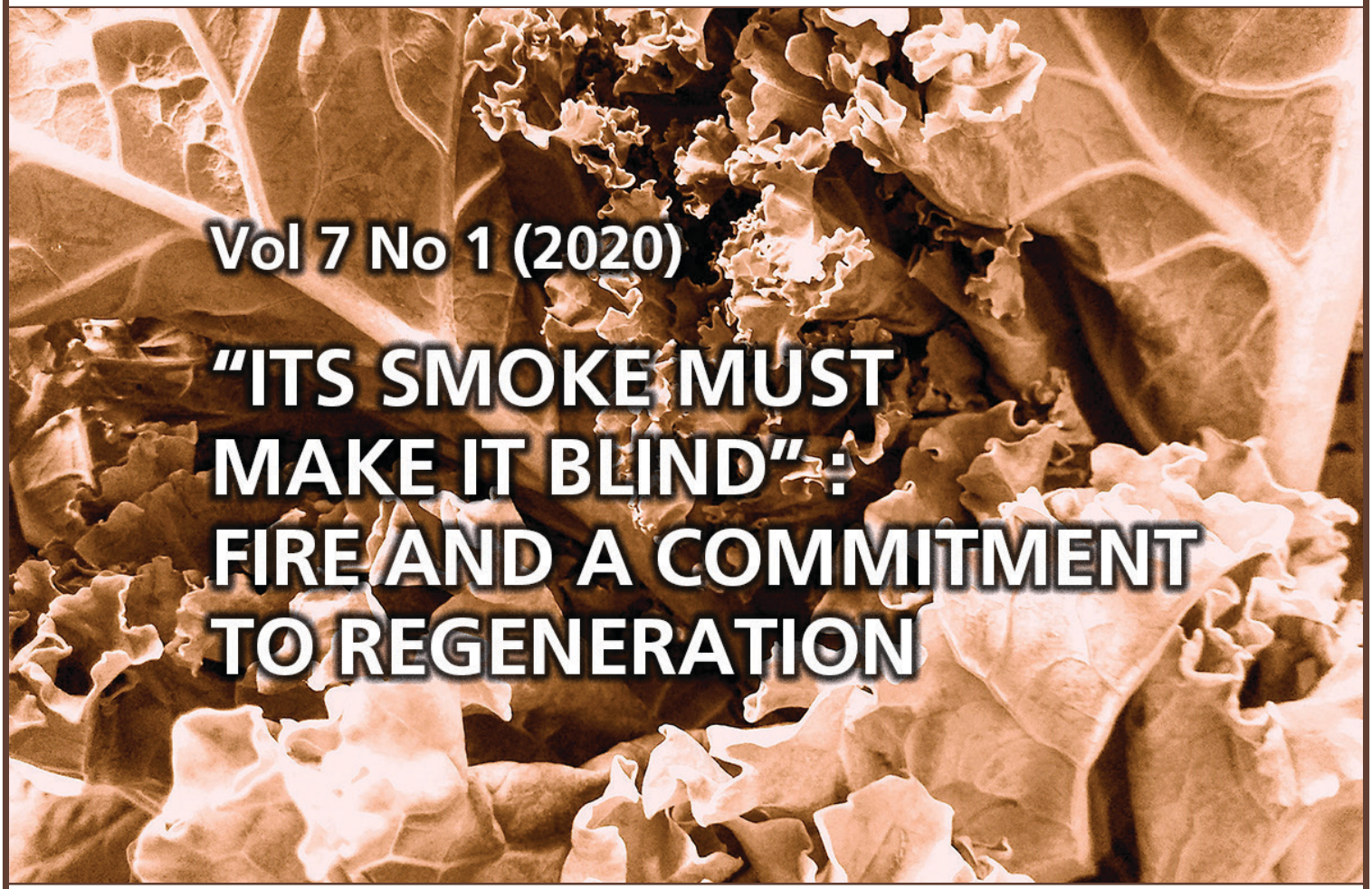

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"ITS SMOKE MUST MAKE IT BLIND": FIRE AND A COMMITMENT TO REGENERATION

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c/o Department of Health Sciences
Lakehead University
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Thunder Bay (ON) P7B 5E1

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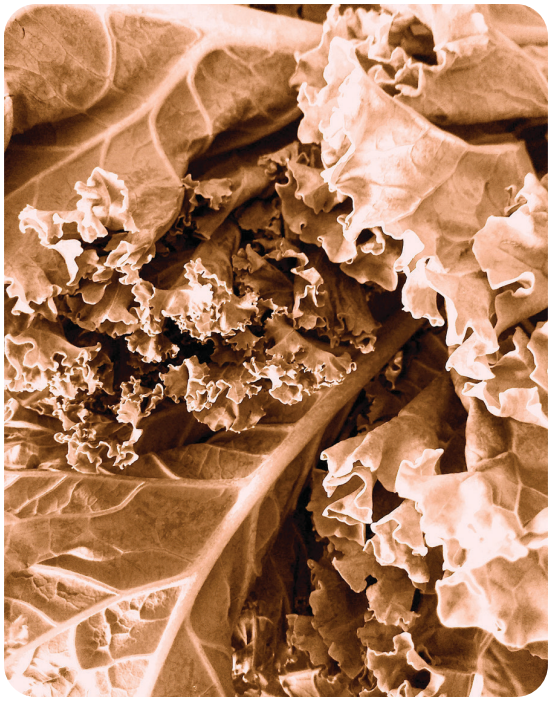
IN THIS ISSUE



The COVID-19 pandemic has made visible some of the most problematic elements of modern society. People and communities that have been made most vulnerable throughout history are being impacted much more severally by the disease itself, but also by the impact of isolation, job losses and the additional mental and physical stress. The deaths of George Floyd, Tony McDade, David McAtee, Chantel Moore, Breonna Taylor, Ahmaud Arbery, Rodney Levi, among countless others, at the hands of police are (yet another) wake-up call to the ongoing systemic oppressions that are part of a living reality for Black, Indigenous and People of Colour. In Canada, there is a particularly nefarious history of Black and Indigenous people being disproportionately killed by police, incarcerated, and treated as second class citizens. The burning that is so apparent in this moment is not an explosion that incinerates everything in its path but a slow burn that has been in motion for hundreds of years and is only increasing in intensity. What we are seeing and experiencing today are the implications of capitalism, white supremacy, patriarchy and settler-colonial systems and structures that have been intentionally established to benefit those in power at the expense of the majority of the world's population.

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Canadian Food Studies La Revue canadienne des études sur l'alimentation

Editorial

"Its smoke must make it blind"[1]: Fire and a commitment to regeneration

Charles Z. Levkoe, Alyson Holland, Alexia Moyer

As Volume 7, Number 1 of *Canadian Food Studies / La Revue canadienne des études sur l'alimentation* (CFS/RCÉA) goes to print, the world is on fire. The COVID-19 pandemic has made visible some of the most problematic elements of modern society. People and communities that have been made most vulnerable throughout history (e.g., racialized and Indigenous people, women, seniors, and those living in poverty) are being impacted much more severally by the disease itself, but also by the impact of isolation, job losses and the additional mental and physical stress. The deaths of George Floyd, Tony McDade, David McAtee, Chantel Moore, Breonna Taylor, Ahmaud Arbery, Rodney Levi, among countless others, at the hands of police are (yet another) wake-up call to the ongoing systemic oppressions that are part of a living reality for Black, Indigenous and People of Colour. The strengthening of the Black Lives Matter movements, along with associated social justice-oriented movements working in solidarity, are actively challenging systemic racism and oppression in all their forms. In Canada, there is a particularly nefarious history of Black and Indigenous people being disproportionately killed by police, incarcerated, and treated as second class citizens. The burning that is so apparent in this moment, is not an explosion that incinerates everything in its path but a slow burn that has been in motion for hundreds of years and is only increasing in intensity. What we are seeing and experiencing today are the implications of capitalism, white supremacy, patriarchy and settler-colonial systems and structures that have been intentionally established to benefit those in power at the expense of the majority of the world's population.

Many critical food scholars have documented the impacts of this burning across food systems, particularly its uneven impacts on farmers and fishers, workers across the food chain,

[11] This line is from Lorna Crozier's poem, "The Gods Don't Tell Us Everything" written in response to the BC wildfires of 2017. Crozier reminds us that fire doesn't discriminate - even if we do - burning as it does everything in its path.

*Corresponding author: clevkoe@lakeheadu.ca
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women and especially on Black, Indigenous and People of Colour. Despite mounting evidence that we are at a tipping point and a new course is essential. In 2018, the UN (backed by the world's leading climate scientists) warned that we have less than 12 years to keep global warming under 1.5C, or risk the consequences of increased droughts, floods, and extreme heat. While this would have devastating consequences for all humanity, it will be felt most acutely by those living in vulnerable situations as access and availability of food is threatened. In this issue, Ross and Mason draw our attention to the concerns of Indigenous peoples in the Northwest Territories over the effects of climate change. The climate crisis is not new and has already had disastrous impacts on the planet and its inhabitancy. In this vein, Ross and Mason use Indigenous methodologies to explore how communities can combat the rising threat of food insecurity through the adaption of local food procurement programs that can not only provide consistent access but also recognize the cultural importance of wild foods for these communities. Read it alongside Kristen Lowitt's review of *Indigenous Food Systems*, a collection of essays that brings together and calls attention to the Indigenous scholars, communities, and settler allies at work with and through food.

In this current climate of uncertainty, the importance of alternate food access cannot be emphasized enough. As the current health crisis becomes an economic crisis the question of food insecurity has been pushed to the forefront, as evidenced by images of miles-long lines to access food banks, bare shelves in grocery stores, outbreaks in processing facilities, and general concerns about the sustainability of food systems. Who has access to food, who does not, and how can this imbalance be rectified are questions asked by several of the authors in this issue.

Two original research articles focus on food and food systems through postsecondary institutions. The first piece by Meredith Bessey, Lesley Frank, and Patricia L. Williams titled, **"**Starving to be a student" looks at increasing concerns of food insecurity among undergraduate students in Nova Scotia along with the barriers, facilitators, and potential policy solutions. Like food security in society as a whole, the authors find that lack of material resources were the primary cause of food insecurity. In addition, they identify the need for broader systemic changes that do not rely on charity responses. The second piece by Michael Classens and Emily Sytsma titled, "Student food literacy, critical food systems pedagogy, and the responsibility of postsecondary institutions" addresses pedagogical approaches for teaching about just and sustainable food system. Their article argues that food studies educators need to focus more directly on critical food literacy.

Other authors focused their attention at the community level. In her research article, "A Participatory Study of the Health and Social Impact of a Community Food Centre in Ottawa, Canada", Aganeta Enns, considers ways that community-based initiatives can build longer-term solutions to growing rates of food insecurity. In a qualitative study of the Parkdale Food Centre in Ottawa, Ontario, Enns argues that traditional food assistance can be greatly enhanced through integrating food, health, and social programming.

Finding alternate ways of accessing and disseminating food is not only desirable, but necessary. However, the growing number of alternate food options raises new questions about

definitions, labels and who is truly being provided access. This is an issue raised by Si and colleagues, who turn their attention to CSAs in Canada and China. They question the meaning of the term CSA and who has access to them. They argue that the potential for increasing access to healthful foods exists through the use of CSAs, especially as the pandemic threatens supply chains, but that they may not be easily adapted to the most vulnerable and food insecure. Turner and Minaker present another alternate food option in the form of community gardens. Theirs is a quantitative study of the economic, environmental and social impacts of this particular kind of urban agriculture. In seeking to convey the value of community gardens in monetary terms, Cochran and Minaker are building a case for their investment potential in the eyes of policy makers and government officials.

In the wake of COVID-19 outbreaks in processing plants, food safety as an aspect of food security has been covered widely in the news media. In this issue Speed and colleagues introduce an important discussion about building better collaboration between public health sectors that deal with food safety and security in British Columbia. While written before the pandemic, the importance of finding collaborative ways to ensure food safety while maintaining food security is an issue being felt globally. As food security becomes an even more widespread concern in the face of the continuing COVID-19 pandemic the questions being asked by these authors are more important than ever.

The need for more sustainable, accessible food is also brought to light in three reviews. Fabiana Li's review of Ann Shin's documentary, *The Superfood Chain* is a timely reminder of the resources, labour and the practices behind the glamourized quinoa, kale, salmon and acai. The small bright local strawberries now being harvested look nothing like Julia Guthman's portrait of the California strawberry as reviewed by Janette Haase (pictured with black flesh, yellow leaves, grown as they are on oil and chemicals). Both reviews give us an account of what political action looks like, as delivered by film and books – as well as venturing to suggest what it *could* look like if a more just and sustainable food system were to be achieved. Finally, Serge-Olivier Rondeau looks at the newest edition of Michael Carolan's *The Sociology of Food and Agriculture* and unpacks its pedagogical uses and its critical reach.

Ellyse Winter's article "Obscuring the Veil: Food Advertising as Public Pedagogy" looks at accessibility through another lens. Accessibility means availability and affordability. Moreover, it also means transparency. Drawing on Marx's commodity fetishism, Winter investigates the ways that food advertisements and packaging conceal the social, economic, and environmental relations behind the animal products and by-products consumed in Canada and the United States. She argues that critical food pedagogies can play a vital role in exposing the underlying framework of our industrial food system.

While COVID-19 has laid bare the structural inequalities underlying our societies, it is also being felt daily on an individual level across the globe. The loss of daily social rituals, the abrupt transition to digital interactions, and the lack of a clear timeline for when things might return to 'normal' have fundamentally changed how we interact with each other. Emily Reisman reflects on this in her commentary on the effects of COVID-19 on the Jewish seder, an

experience which likely rings true for many who have attended important social events through a digital lens, rather than in person. While her article focuses on hope for future change, it reminds us of the importance of carrying forward the collective remembering of not just the effects of the pandemic, but also the issues it has revealed.

As any ecologist knows, burning is destructive but it leaves in its wake new growth, new life and new possibilities. In Canada, we see Black, Indigenous and People of Colour taking leadership in a new round of uprisings and protests, speaking and writing, teaching and research - not just today but building from the time that the burning began. While many of us are outraged, we also recognize that we have a responsibility to not just stew in our frustration and point fingers at others, but also look within, at ourselves because we can all do better.

This is especially true for CFS/RCÉA. It has been one year since we launched our new governance structure, with two hard working staff, a strong and diverse Editorial Collective, a Governance Committee made up of Canadian Food Studies (CAFS) board members and a committed Journal Advisory Board. We have published many insightful volumes with critical and insightful articles, and we have much to celebrate. In June 2020, we held a journal retreat to reflect on the past year and discuss the current moment. The group identified many ideas for the journal's long-term sustainability but also recognized that there is also room for improvement to making the journal even better.

In June 2020, CAFS released a statement on racialized police violence that was grounded in its mission to promote "critical, interdisciplinary scholarship". The statement acknowledged that systemic and institutionalized racism is not just a historical feature but is active within academia and is experienced acutely by Black communities as well as Indigenous Peoples. It stated, "As food scholars and educators, we have a collective responsibility to acknowledge these truths and work to actively confront and challenge them through research, teaching, critical analysis, and collective action." The CAFS board committed to a number of actions including to learn and work within an anti-racism paradigm. They also committed to reporting back to the membership and sharing additional steps in the near future. Regeneration is possible, and CFS/RCÉA is committed to doing that work.

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Canadian Food Studies La Revue canadienne des études sur l'alimentation

Commentary

"Next year, together": A ritual meal amidst COVID-19 magnifies the politics of place

Emily Reisman[a*]

[a] University at Buffalo

Arms outstretched, we raised our glasses of ceremonial wine toward the glowing screens before us and chanted familiar blessings in a language few of us truly understand. Thus, we prepared for the annual retelling of the legendary Exodus from Egypt, this year via teleconference. Twelve neatly arrayed digital boxes broadcast the dinner tables of cousins, aunts, uncles, brothers, and sisters scattered across the North American continent. We fumbled through the Four Questions, each muffled repetition of "*Why is this night different from all other nights?*" met with smiles and sighs. Jokes delayed through complex communication circuits dissolved before they reached their destinations. Our miniscule computer microphones tried valiantly to transmit the cascading voices of wine-soaked songs. Despite the distance, there were more of us "together" on this night than ever before, thirty at its peak. This scale was enabled not only by the turn to digital devices but also by our thirst for social interaction and a sense of normalcy amidst the constrained connections of the COVID-19 pandemic.

Rituals, which gain strength through repetition, are all the more significant and strange when removed from their usual terrain. For Jews in North America, and around the world, sunset on April 8, 2020 marked a Passover uprooted. The *seder* meal that begins the holiday is arguably the most culturally significant Jewish event of the year, one deeply sedimented by live performance and shared space. This year, instead of inviting family, friends, and friendly strangers to sit shoulder to shoulder, we circulated sterile video conferencing links. Instead of paging through the illustrations of the *haggadah,* a colorful booklet of recitations for the evening's proceedings, we scrolled down a lifeless PDF.

There is much to be said about a structured meal that invites reflection on freedom, oppression, plagues, and borders in the time of a global health crisis with starkly unequal effects.

*Corresponding author: ereisman@buffalo.edu
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The *seder* is an act of edible symbolism in which culinary objects are subjected to relentless inquiry and interpretation. *Matzah*, unleavened bread, serves as a reminder of the lives of refugees, their routines disrupted and displaced. Ten drops of wine, representing 10 plagues suffered by the Egyptian people, are solemnly removed from our glasses to recall that the privileges we enjoy today are not free from pain inflicted on others. A boiled egg symbolizes mourning, or rebirth, or both. Yet this year, when the emotional, historical, and moral complexities of human liberation are so palpably relevant to a world of structural violence laid bare by a virus, the mood was muted. Fatigued by the mediation of digital devices, we moved quickly through the prescribed rituals with little space to linger. Without a shared table, the dialogue was more perfunctory than penetrating.

And yet. While the placelessness of a digital dinner disappointed, the floating format also yielded a new and unusual possibility. Huddled around the strange blue light, a single, potent turn of phrase transformed. An age-old anthem remade itself right before my screen-weary eyes. The classic closing words of the ceremony rewrote themselves, deviating poignantly from a lilting loyalty to the script. Instead of "Next year in Jerusalem," my cousins called out to one another, "Next year, together."

The improvised edit, which may appear slight, was nothing short of extraordinary. For more than a century, the *seder* has been tinged with Zionist sentiment. The customary closing aspiration, "*Next year in Jerusalem*," echoing the hopeful journey of Moses and his followers toward a life safe from oppression, is now often taken literally as a call to deepen commitments to Jewish statehood in contemporary Israel-Palestine. The idea that this land belongs to the Jewish people has provided a sense of security for some, while simultaneously justifying devastating wars, the displacement of more than five-and-a-half million Palestinian people, an oppressive occupation, the repeated denial of basic human rights, and daily acts of violence (Clarno, 2017; Khalidi, 2020; Lloyd, 2012; Peteet, 2017). It has made Gaza one of the most densely populated places on Earth and left its over two million residents with only 70 intensive care beds (Physicians for Human Rights, 2020; World Health Organization, 2019),[11] a politically produced coronavirus calamity waiting to happen. It is also the reason I retreated from the Jewish practices of my family for many years and continue to wrestle with my inherited identity. I am enraged and ashamed by the brazen blindness of so many of my kin to the cruelty and injustice in which we, as Jews and as North Americans, are complicit.

If COVID-19 were not keeping us apart, I would have hosted a *seder* among politically like-minded friends that invited self-reflection, compelling us however modestly toward greater accountability and more just action. Instead, I joined my extended family for an evening focused on sending comfort to one another. For some sharing in this virtual meal, any criticism of Israel would be intolerable. But somehow, "Jerusalem," that most contested site of passion and pain,

[11] This limited health infrastructure was exacerbated by the Trump administration's sudden discontinuation of $300 million in annual contributions toward the UN Relief and Works Agency for Palestine Refugees in the Near East beginning in 2018.

slipped away. A call for togetherness took its place. It was as if the safety, abundance, and fulfillment that a holy city represents had been subconsciously substituted with a recognition that our well-being is far more dependent on one another than on any imagined land of plenty. Concluding a meal of ritualized hope, I couldn't help but hope for a togetherness that replaces talk of territory with commitments to mutual responsibility. At least for a moment, amidst a modern plague, we reached toward our shared humanity.

Yet my family's craving for togetherness might also have come from a narrower desire to protect and preserve those closest to us. Together might not mean everyone, everywhere. By tradition, the *seder* implores us to welcome strangers into our home, an act of inclusion now nearly unthinkable as bodies are recast as biohazards. The health crisis has hardened borders and heightened acts of hate worldwide. As COVID-19 cases rise in Israel-Palestine, fragile collaborations begin to crumble (Najib & Halbfinger, 2020). This *seder*'s turn from territory toward togetherness was momentarily untethered from the politics of place. Yet omission is also avoidance. The fact that side-stepping the issue could feel like progress is itself unsettling.

A ritual meal during COVID-19 is an uneasy opening, destabilizing old ways with uncertain direction. Ceremony allows small acts to carry outsized effects. It matters how we articulate our hope.

Next year, together?

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Canadian Food Studies La Revue canadienne des études sur l'alimentation

Perspective Article

Student food literacy, critical food systems pedagogy, and the responsibility of postsecondary institutions

Michael Classens* and Emily Sytsma

Trent University

Abstract

There has recently been a marked increase in scholarly interest in both food systems pedagogy and food literacy. So far, however, there has been very little work attending to the intersection of these two crucially important interventions. We argue that a distinctly *critical* food systems pedagogy must be grounded in and enabled through an equally critical food literacy. We forward a provisional definition of critical food literacy and make the argument that postsecondary institutions should be invested in ensuring that all students – not only food studies students – are exposed to critical food literacy training.

Keywords: Critical food systems education; student food literacy; post-secondary learning; food systems

*Corresponding author: michaelclassens@trentu.ca
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Introduction

Up until very recently, and with very few exceptions, food systems pedagogy has not had much attention from scholars. As one of a small handful of leaders in the field puts it, "those who study learning have not often turned their gaze toward food, while those who study food have generally overlooked the learning associated with it" (Sumner, 2016, p. xix). However, this is beginning to change. Scholars are sketching the contours of a food systems pedagogy—an approach to teaching and learning about food that is interdisciplinary (Valley et al., 2017), that embraces complexity (Jordan et al., 2014), and that includes experiential learning opportunities (Levkoe et al., 2018; Miller et al., 2012). Importantly, scholars are insisting that *critical* food systems pedagogy must also be values-based (Galt et al., 2012, p. 43) and pose a challenge to the social and ecological injustice perpetuated by the contemporary industrial food system (Flowers & Swan, 2012; Sumner, 2016).

This is all crucial work, but where does food literacy fit in? Though it remains "a concept under construction" (Sumner, 2013, p. 82), we argue that food literacy must be incorporated into and supported by critical food systems pedagogy in order for the field to be truly transformative. This union ought to be the foundation of existing food studies programs—but, perhaps more importantly, we also argue that critical food literacy ought to be a university-wide commitment meant to benefit all students, not only those enrolled in food studies programs. Taking the "pedagogical turn" (Flowers & Swan, 2012, p. 424) in food studies seriously requires a commitment to food learning beyond the immediate walls of the food studies classroom. It means asking, "how do we help citizens, not consumers, engage positively with their food system?" (Slater, 2017, p. 18). All students eat—though far too many face food insecurity—so we argue that postsecondary institutions need to take some ownership over educating their students in critical food literacy. Jennifer Sumner (2013) suggests that critical food literacy allows us to "read the world through food" (p. 86). Our focus within this short piece is narrower, but our proposition is no less provocative: how might we transform our campuses by reading them through food?

Food literacy

Consensus has yet to emerge on the meaning of food literacy (see Truman et al., 2017; Velardo, 2015), and indeed a range of diverse meanings may be central to the ongoing value of the term within food-learning contexts.[1] Truman et al. (2017) recently proposed a useful working definition of food literacy, informed by a comprehensive scan of related literature and engagement with key stakeholders. Their work reveals two interrelated categories of knowledge related to food literacy. Functional knowledge includes "broad sets of skills and

[1] A recent scoping review by Truman et al. (2017) found thirty-nine distinct definitions of food literacy.

knowledge…food identification; physical, emotional and mental effects of food; as well as basic abilities related to food" (Truman et al., 2017, p. 213). Critical knowledge, on the other hand, "allows people to perform actions related to food and think critically about their relationship to the broader food system" (Truman et al., 2017, p. 213). Drawing on notions of critical literacy, Yamashita and Robinson (2016) propose four elements of distinctly *critical* food systems literacy, including the ability to "(1) examine one's own values with respect to food systems; (2) grapple with multiple values and perspectives that underlie food systems; (3) understand the larger sociopolitical contexts and factors that shape food systems; and (4) take action toward social justice in food systems and sustainability more broadly" (p. 273).

Our own provisional understanding of food literacy attempts to integrate the practical with the political, recognizing that our everyday encounters with food are both pedestrian and profound and that food literacy should equip us to deal with food in this way. We thus interpret critical food literacy in broad terms, as a set of skills, knowledge, and understandings that (1) equip individuals to plan, manage, prepare, and eat food that is healthy, culturally appropriate, and sustainable, while (2) enabling them to understand the broader sociopolitical and ecological dynamics of the food system, and (3) empowering them to incite socioecological change within the food system.

The work of conceptualizing how to weave critical food literacy into the fabric of campus life is an ambitious project, beyond the scope of this short text. Instead, to illustrate the analytic power and transformative potential of critical food literacy, we briefly consider student food (in)security on campus in a number of cases. Despite the fact that food literacy skills have been shown to play a key role in a variety of important areas related to health outcomes and food security (Anderson, 2007; Thomas & Irwin, 2011), reducing food insecurity to a simple matter of food literacy is highly problematic (Huisken et al., 2017). That is not our intention here. However, the incidence of food insecurity among university students is very high (Maynard et al., 2018a; Nazim et al., 2019), not particularly well understood (Bruening et al. 2017), and, as we discuss immediately below, may be undermining the educational mandate of universities (Farahbakhsh et al., 2017). We therefore suggest that every tool available should be deployed to better understand and end student food insecurity, and we argue that critical food literacy can contribute productively to this end.

Student food insecurity

The scope and depth of postsecondary student food insecurity is not well understood (Bruening et al., 2017), however, available research suggests it is an alarming and growing problem (Maynard et al., 2018a; Nazim et al., 2019). Those who are food insecure have limited access to the adequate and appropriate food required to meet their nutritional needs and struggle to acquire food in a "socially acceptable way" (Olauson et al., 2018). At Trent University (our own

institution), nearly half of all first-year students recently reported being food insecure (Dasné & Furgal, 2017). This is nearly triple the rate of food insecurity in our wider municipal community of Peterborough, which, at sixteen percent, is among the highest in the province (Peterborough Public Health, 2018). Nationally, forty percent of students will experience food insecurity at some point during their postsecondary career (Maynard et al., 2018a). A two-decade trend of rising tuition fees and cost of living, coupled with a stagnating value of student grants, seems to be exacerbating campus food insecurity (Farahbakhsh et al., 2015; Farahbakhsh et al., 2017). Meanwhile, a persistent 'starving student' ideology normalizes the conditions that leave so many students food insecure (Maynard et al., 2018b).

There is scarce research on the long-term effects of food insecurity on postsecondary students, though adjacent data are instructive. Food insecurity among adolescents has been shown to elevate stress and anxiety, resulting in poorer education outcomes (Jyoti et al., 2005). In adults, meanwhile, food insecurity leads to chronic health problems (Laraia, 2013; Seligman et al., 2010) and lower work productivity (Borre et al., 2010; Devine et al., 2006). In a recent study conducted with users of the campus food bank at the University of Alberta, researchers found that students who identified as severely food insecure had more difficulty concentrating during class, attending class, studying for exams, and completing assignments than their more food secure counterparts (Farahbakhsh et al., 2017). Importantly, factors such as academic achievement and wellness contribute to student retention and graduation rates (Cady, 2014). Postsecondary institutions have taken notice, as demonstrated by the proliferation of on-campus food banks in recent years (Farahbakhsh et al., 2017). Yet this is a wholly insufficient intervention. By undermining successful learning outcomes, and potentially creating an impact on student retention and graduation rates, student food insecurity threatens the *raison d'être* of postsecondary institutions. For this reason alone, food security—and critical food literacy—ought to be central commitments on all campuses.

The limitations of the current status quo, as we see them, are threefold. First, many campuses outsource their food services to internationally owned institutional providers, such as Chartwells or Aramark. These institutional providers rely on large contracts with food suppliers to ensure a consistent supply while maximizing their profit margins. This tends to result in an emphasis on processed foods to avoid the high-labour costs associated with cooking with fresh ingredients (Reynolds & Hunter, 2017). Students beholden to these corporate food services are taking note of the implications. In a survey conducted by the Canadian Federation of Students-Ontario (2017), students highlighted a lack of variety as a key concern. This is especially relevant for international students, who have little access to culturally appropriate foods on campus. The report also showed that the most common critique registered by students was with respect to the high price of food at on-campus retailers relative to off-campus locations. For students on campuses situated outside of urban centres—in veritable food deserts, like those at Trent University—lack of variety and high costs are inescapable realties. At the same time, these procurement strategies, accompanied by stringent food-safety standards, create substantial barriers to the attempts of small-scale local suppliers to gain access to the public food sector

market and ultimately reinforce the industrial food system (Reynolds & Hunter, 2017). Yet Stahlbrand (2016) emphasizes the potential for large public institution purchasers to drive local procurement and, in turn, improve food system sustainability.

In a related way, students are generally not supported to understand where their campus food comes from, including how it was grown, who grew it (and under what conditions), or who prepared it (and under what conditions). Even where local procurement strategies are implemented by institutions, Maynard et al. (2018b) found that forty-three percent of students were not aware of local sourcing efforts on campus, and seventy-seven percent of students were not familiar with fair-trade programs on campus. This suggests that our postsecondary institutions are failing to communicate even the 'good news' stories about campus food, leaving a vast disconnect between food service and students' perceptions of the food to which they have access on campus. The little information students get about their food from promotional materials and labeling schemes—while often portrayed as an attempt at promoting food literacy and transparency—is of questionable value. Nutritionism, the process by which food is reduced to its nutritional content or its professed disease preventing capabilities, is a key marketing technique used to propel industrial food (Scrinis, 2008). Placing caloric values on menus reduces food to its most basic biological component and ignores not only the source of those calories (e.g., fats, sugars, proteins) but also the journey that food has taken from farm and factory to plate. An emphasis on labels—whether nutritional, fair trade, local, or organic—can also be depoliticizing, recasting students as (ethical) individualized consumers and reinforcing the neoliberal notion that we can shop our way to a better world (Low & Davenport, 2007).

This is compounded by a second threat to food literacy and security—the lack of on-campus amenities to support student cooking. Many students, particularly those living in residence, have little access to proper facilities for storing and cooking food. At Trent, for example, dorms are not equipped with kitchens. Even for off-campus students who wish to bring their own food, finding a microwave on campus to reheat homemade meals can be a serious challenge. Without a fridge to store fresh groceries, a stovetop to cook a homemade meal, or a microwave to reheat leftovers, students are left with little choice but to frequent the cafeterias, where they will often pay more for individual meals than if they had shopped in the supermarket or farmers' market. The lack of supportive amenities on campus channels students to the fast-food offerings, likely reinforcing the corporate food paradigm and contributing to food deskilling and food illiteracy.

Finally, these two preceding issues are—in our experience—exacerbated by very little critical food literacy curriculum content. Despite an increasingly rich and insightful range of food systems curricula at a handful of universities across Canada (see for example Valley et al., 2017), most students outside of food studies programs are not likely to encounter even an introduction to practical food skills in any of their classes, let alone the more ambitious lessons of critical food literacy. At Trent, students have access to a number of courses that offer critical appraisals of the contemporary food system, including a course called "The Edible Campus" that centres campus food systems as an empirical focus for scrutiny. Nonetheless, these courses reach

an exceedingly small percentage of Trent students. For example, "The Edible Campus," a small fourth-year course taught by the first author, typically has ten to twelve students per year, a fraction of a percent of the over 10,000 students enrolled at the university. Trent does boast a thriving set of campus entities—for example the Sustainable Agriculture and Food Systems Student Society and The Seasoned Spoon (a non-profit vegetarian café that operates independently of Chartwells)—that organize occasional workshops designed to increase student food literacy. However, they are largely student run, funded through student levy fees, and do not have the capacity to provide a comprehensive, campus-wide approach to critical food literacy.

Toward a comprehensive food pedagogy

Food literacy begins long before people attend university. We are constantly learning, in informal ways, through our every encounter with food (see Sumner, 2016). Food is discovered, understood, and appreciated through informal learning in the home—whether searching for an online recipe and making an ingredients list or following along as a family member cooks a traditional dish. Informal food learning also continuously happens in our communities. Growing a garden, talking to local farmers at the market, sharing recipes with neighbours, and cooking and eating with friends and family all contribute to food literacy from a young age. And yet, deskilling is a constant spectre and ongoing threat to food literacy and food security (see Desjardins et al., 2013). These skills and knowledge are lost as families struggle for the time, money, and skills required to maintain a diet that not only provides basic nutrient requirements but also adds joy and meaning to life (Slater, 2013). Parents have reported wanting to include children in meal preparation, but this is weighed against a desire to mitigate mess and time wastage (Fulkerson et al., 2011). With young children in the house, the kitchen can become an off-limits space (Slater, 2013), a place of no-nonsense utility, in the nightly scramble of dinner-dishes-bath-bedtime.

By the time they reach adolescence, many young people tend to have low levels of food literacy with respect to practical skills and capabilities, and they have minimal knowledge about the broader socioecological and political aspects of their food systems (Ronto et al., 2016). There are very few opportunities outside the classroom designed to increase food literacy among adolescents (Thomas & Irwin, 2011). Within the classroom, the opportunities are not much better. The Ontario high school curriculum includes one food and nutrition course for grade nine or ten and one nutrition and health class for each stream (workplace, college and university preparation) in grade twelve (Ontario Ministry of Education, 2019). None of these courses are compulsory—though civil-society actors are actively lobbying the provincial government to change that (see Ontario Home Economics Association, 2018). Adolescents do, of course, learn about food (though not necessarily food systems) in informal settings, however research suggests

that rates of adolescent food literacy remain low (Ronto et al., 2016). Furthermore, their diets are typified by high consumption of sweetened beverages and fast food (Nelson et al., 2008; Worsley, 2015).

It is therefore not surprising that by the time students arrive at postsecondary institutions they are predisposed to selecting the convenience items available in cafeterias and on-site fast food franchises. And yet, rather than organize the campus food system in ways that enable *different* choices to be made, most universities—through the three-pronged process described above—reinforce food illiteracy. Nevertheless, many university and college students are at a key developmental stage of figuring out who they are, determining what their core commitments are, and establishing the patterns they will carry with them well beyond their school days (Tam et al., 2016). In other words, this period is a critical intervention opportunity to support students in pre-figuring relationships to food that are different from the conventional ones promoted by our campus food systems.

To date, a number of responses have been enacted. For example, some campuses offer cooking classes and food budgeting workshops (Maynard et al., 2018b). On our own campus, The Seasoned Spoon offers a number of workshops for purchasing and cooking food on a tight budget. While these workshops have an impact on those who take them, they reach only a handful of students, and are ultimately of limited utility in the face of the broader issues outlined here. What is required, instead, is a comprehensive and supportive approach to student food literacy. At universities offering food studies or food sciences degrees, food literacy should be integrated into the broader pedagogical approach of the program.

While we resist being overly prescriptive (given the diverse contexts and student populations at postsecondary institutions), it is clear that campuses can be doing more to improve food security and support student food literacy on campus. Campuses need better kitchen and food-preparation facilities both for students in residence and for those who live off-campus. Campuses should remove corporate fast food chains and replace them with independent retailers that source locally produced goods. Canadian campuses have considerable purchasing power and therefore have the capacity to induce change (Reynolds & Hunter, 2017). Indeed, research suggests that innovative institutional procurement approaches can support social justice and environmental sustainability outcomes (Friedmann, 2007; Stahlbrand, 2016).

All students should receive basic education about food systems, including the social and ecological unsustainability of current practices, as well as specific examples of the inspiring work underway to forge alternatives, both locally and in other regions. All students should be enabled to learn basic budgeting and cooking skills and to reduce their reliance on meal plans. Campuses should host more farmers' markets, encouraging students to engage with growers and acquire a deeper understanding of local food systems. Campus organizations should support cooking demonstrations, while campus newspapers should print healthful and budget-friendly recipes that students can make with their friends and roommates. Administrators should seek out food-service providers that can deliver sustainably produced, culturally appropriate, and healthful food, while supporting students with the knowledge and tools of food literacy. In short,

postsecondary institutions should take on the challenge of ensuring that all of their students are food secure.

Most of all, students themselves should be consulted, engaged, and encouraged to act. Beyond paying for the campus food system through their tuition and food purchases, their bodies, psyches, and academic and personal successes are beholden to that system. At Trent, we have anecdotal evidence to suggest that administrations are willing to listen. In 2014, the Trent Central Student Association (TCSA, Trent's undergraduate student union) published what amounted to an indictment of Trent's campus food system (TCSA, 2014). They found that ninety-seven percent of student respondents (n=661) were unsatisfied with the food services available on campus. The report included twelve recommendations, from increasing the presence of food vendors not subject to the primary corporate food contract to ensuring that all eating areas on campus are open to all students, not only those with the ability to pay. Encouragingly, and to the credit of Trent Food Services, many of the recommendations in the report have been implemented in the last five years[2]. There is nonetheless much more to be done, particularly around the support for food literacy.

Finally, it is worth underscoring that integrating food literacy and the struggle for student food security into food systems curricula is an important way of enhancing food systems pedagogy. The feminist geographer Gibson-Graham (2006) argues that a good way to start making positive change is to take advantage of "the ubiquitous starting place of *here* and *now*" (emphasis original, p. 194). For values-based, justice-oriented food studies programs, the here and now of the campus provides an effective window through which to view the broader problems of our contemporary food systems. For example, teaching food literacy to students on campus also provides an opportunity to teach about the gendered nature of food labour and food deskilling. Investigating where campus food comes from, and why the food choices on campus are the way they are, can introduce other themes, such as the political economy of corporate food systems. Similarly, talking about student food insecurity can help articulate the inequality of food systems in concrete terms. In parallel, collaborating with groups that foster student food literacy and student food security on campus is a way for educators to reveal to their students the important world of food justice advocacy and to teach their students about the power of political organizing and solidarity. In turn, integrating formal learning in classrooms with non-formal learning initiatives hosted by allied groups (e.g., student unions, campus food advocacy groups, local activist organizations) can be a way to enrich the student experience while demonstrating linkages between education, future professional work, and social engagement.

University campuses are an ideal context in which to model many important and progressive practices—from prioritizing equity and diversity to pursuing environmental sustainability. In parallel, campus food systems represent a new horizon for food systems pedagogy to help shape a food-literate and food-secure population. By incorporating occasions to adopt a focus on critical food literacy, food systems curricula can support and even lead this

[2] There are plans underway to reproduce the 2014 study in the coming academic year.

effort. The result will be widespread student success, as well as food systems students who are better prepared to understand, survive within, and challenge the social and ecological unsustainability of the contemporary corporate food system.

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Original Research Article

Examining local food procurement: Adaptive capacities and resilience to environmental change in Fort Providence, Northwest Territories

Paulina Paige Ross* and Courtney W Mason

Thompson Rivers University

Abstract

By exploring localized adaptation strategies for climate change, this paper aims to provide a deeper understanding of local perspectives and efforts regarding food procurement in Fort Providence, Northwest Territories (NT). The benefits and risks associated with engaging in local food procurement activities are key topics explored. Strategies to manage food insecurity and local approaches to encourage food procurement are also considered. This study was informed by Indigenous methodologies, which guided all aspects of this research. While the researchers have collaborated with community members since 2010, evidence for this study was collected during two field seasons in the spring and fall of 2018, using semi-structured interviews with Elders, land-users, and knowledgeable community members. Findings support decentralized policy developments which focus on the integration of local voices into decision-making processes and program implementation. Food policies must reflect the needs of residents at localized levels and the distinct socio-cultural and economic barriers to procuring food, and they must encourage overall community resilience and adaptive capacities to climate-related change. This research supports regional and national efforts to reduce food insecurity across northern Canada by documenting traditional knowledge concerning climate change and local food practices in Fort Providence.

Keywords: Food security; climate change; Indigenous peoples; rural; subarctic

*Corresponding author: paulinaross10@gmail.com
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Introduction

Food security[1] challenges among Indigenous communities in northern Canada are a significant concern that is exacerbated by changing socio-cultural, economic, and environmental conditions (Council of Canadian Academies, 2014; Kenny et al., 2018; Rosol et al., 2016; Skinner et al., 2013; Spring et al., 2018). The Northwest Territories (NT) report that 19.3% of adults over the age of 12 are food insecure, while the national average is 7.3% (Northwest Territories [NT] Bureau of Statistics, 2014). Indigenous communities in the NT continue to rely on the environment for subsistence, and it supports, to a degree, food security and cultural resiliencies. The high level of food insecurity in the NT correlates with socio-cultural and economic barriers experienced disproportionately by Indigenous households, and this is aggravated by ongoing climate change (Council of Canadian Academies, 2014). Communities are coping with climatic change that is widely predicted to impact temperatures, weather patterns, sea levels, and ecosystems (Intergovernmental Panel on Climate Change [IPCC], 2014).

This paper aims to provide an understanding of local perspectives regarding community-wide resilience to climate change, while identifying current adaptive capacities to support local food procurement and improve food security in Fort Providence, NT. For the purposes of this paper, local food procurement is divided into two categories: wild foods and locally grown foods. Wild foods are resources harvested, hunted, fished, trapped, or foraged regionally from the land.[2] Locally grown foods include vegetables and fruits produced in greenhouses, community gardens, or in aquaponic systems. Research indicates that community gardens and greenhouses are emerging in many northern communities as viable solutions to the limited availability of nutritious market foods and climate change-related barriers to land-based practices (Thompson et al., 2018; Chen & Natcher, 2019). Consequently, this study considers these practices as adaptation strategies.

We contend in this paper that local adaptation strategies to shifting environmental conditions can aid northern food security initiatives, build resilience to climate related change, and support cultural continuities. In order to understand how a community can adapt food procurement practices to climate-related changes and socio-economic constraints, it is first imperative to understand where community vulnerabilities lie. These vulnerabilities are determined by the resources on which residents depend and also by the availability, access, quality, and stability of those resources (Adger et al., 2003). Community vulnerability to climate change can be conceptualized as a function of exposure-sensitivity to shifting environmental risks and the adaptive capacity to deal with those risks (Ford et al., 2006). Exposure-sensitivities reflect the susceptibility of people and communities to biophysical conditions that represent risk,

[1] Food security exists when all people, at all times, have physical, socio-cultural, and economic access to sufficient and nutritious food to meet dietary needs (Food and Agriculture Organization [FAO], 2017).

[2] For Fort Providence residents, this includes: many diverse species of fish; small game such as rabbits, geese, ducks, and beavers; big game such as moose, woodland caribou, or wood bison; and numerous plant and herb species (Wesche et al., 2016).

while adaptive capacity refers to a community's potential to address, plan for, or adapt to exposure-sensitivities (Ford et al., 2010). Adaptation research is typically framed around a community risk assessment, which gathers data about livelihoods, resilience, and hazards (Aalst et al., 2008). This research did not focus on formalized risk assessments; instead, it centered on identifying local food procurement initiatives and recognizing their importance to support overall community resilience and adaptive capacity. The following questions are explored: 1) What are the benefits and risks of engaging in local food procurement?; 2) Do local food procurement strategies support adaptive capacity for climate change?; and 3) What are the barriers to engaging in local food procurement and adaptive capacities at local and regional levels?

Community profile

Fort Providence is a small Dene-Métis community located in the Deh Cho region of southern NT with approximately 800 residents (NT Bureau of Statistics, 2016). It is situated along the banks of the Mackenzie River, downstream from Great Slave Lake (Appendix A). The community is surrounded by several bodies of water that provide access to wild foods year-round. A freshwater delta positioned close to the community, where the Mackenzie River widens at the mouth of the Horn River, forms Mills Lake. The Horn River drains from the Horn Plateau, a region that has been a spiritual home for the Dene people, and an important harvesting location, for millennia. Besides hosting plentiful aquatic and semi-aquatic species, the plateau is a major staging area for waterfowl during spring and fall migrations, a refuge for molting diving ducks in the summer, a grazing area for wood bison in the winter, and a vital moose habitat year-round (ESTR Secretariat, 2013; Species at Risk Act, 2018).

Due to the plateau's significance to local peoples as a critical food harvesting location and their desire to conserve it for future generations, on October 11th, 2018, the Deh Cho First Nations Assembly designated *Edéhzhíe* as the first Indigenous Protected Area in Canada.[3] Covering 14, 218 square kilometers, *Edéhzhíe* is ecologically important to the Deh Cho Dene culture, language, and ways of life (Deh Cho Government, 2018).

Fort Providence has a variety of services, including a local hotel, two small grocery stores and restaurants, a health center, a multipurpose sports center, and a territorial campground. One of the newest infrastructure developments in the region is the Deh Cho Bridge, which was

[3] The 2018 Federal Budget contained support for a $1 billion nature fund. A new designation of park was endorsed, Indigenous Protected Areas (IPAs), which are designed and managed by Indigenous communities. IPAs will make a contribution to Canada's international commitment to protecting 17 % of land and fresh water by 2020. They will also support Indigenous capacity to conserve land and threatened species. By forming *Edéhzhíe* as an IPA, the management board will make its decisions by consensus while encouraging an Indigenous presence on the land. As local communities encounter even more barriers to food security, such as climate change and mounting food production and shipping costs, it is a crucial time to protect these lands from further development by establishing an IPA (Mason, 2018).

completed in 2012. It is the only bridge across the Mackenzie River and the longest bridge in northern Canada (Government of the Northwest Territories [GNWT], 2018). As a consequence of this development, Fort Providence is one of few communities in the NT with all-weather road access.

While many Fort Providence residents maintain traditional practices and continue to be supported by wild foods, market foods make up the majority of foods consumed. However, growing food locally is slowly beginning to emerge as a key part of the local foods system. It is important to emphasize that wild foods and land-based practices remain important for the socio-cultural roles they play in the community. Despite the abundance of natural resources in the area, community members must reply upon income support or employment opportunities to supplement livelihoods. Over half of the adult population in Fort Providence relies on paid income for full year, full time positions (NT Bureau of Statistics, 2016).

Food security and climate change impacts on northern Canada

The Food and Agricultural Organization (FAO) of the United Nations (2017) identifies four food security pillars: availability, access, utilization, and stability. Physical and socio-economic access to healthy, nutritious food that meets dietary and cultural needs varies between communities across Canada's North. Food availability relates to supply levels of food (FAO, 2017). This can include a community member's economic capabilities to purchase food available from the store, or it can refer to, for example, the availability and abundance of certain fish species. Food utilization is understood as the metabolism of food. In Fort Providence, this means preparing and processing culturally appropriate foods, or it can mean knowing how to cook vegetables from a local garden, such as harvested kale or Swiss chard. Wild food stability can fluctuate as climate change impacts wildlife populations. This alters the capacity of Fort Providence households to attain wild foods. Understanding the links between climate change and food security is an important step in strengthening the adaptive capacity of communities for effective options in the future (Wesche & Chan, 2010).

A considerable amount of research on Arctic food security demonstrates the detrimental effects of climate change on food sources (Andrachuk & Smit, 2012; Gerlach & Loring, 2013). Literature on food security in the NT is typically framed around the context of remote fly-in communities, and most research is conducted at higher latitudes where remoteness, access limitations, and costs are much higher (Rosol, et al., 2016). Less literature concerns Subarctic food security (Spring, et al., 2018). The importance of wild foods to the overall health and cultural well-being of northern Indigenous people is widely recognized, as procuring, harvesting, sharing, and consuming them play an integral part in northern cultures (Gerlach & Loring, 2013; Rosol et al., 2016; Spring et al., 2018). However, there appear to be a growing number of barriers related to local food procurement, including gaps in traditional ecological knowledge, mounting economic costs associated with land-based travel, and risks associated with climate

change and harvesting practices (Robidoux & Mason, 2017; Skinner et al., 2013). Plants, animals, and people living in the North depend upon the cold stable conditions to maintain circumstances they need to be successful (GNWT, 2008). These deductions are mirrored by countless findings outlining the local and global consequences of climate change, which impact a wide range of species, ecosystems, and people who depend upon them (Andrachuk & Smit, 2012; Douglas et al., 2014; FAO, 2017; GNWT, 2016; IPCC, 2018; Rosol et al., 2016).

Methods and methodologies

From the conception of the initial research questions to establishing relationships between researchers and local community members in the Deh Cho region, this study benefited from the direction and guidance of Indigenous methodologies (IM). This research was steered by IM's core paradigms of trust, respect, reciprocity, and inclusion (Kenny, 2018; Kovach, 2010), which helped foster collaborative relationships where Indigenous perspectives and ways of knowing were privileged in the overall research process. IM frames a holistic understanding of the complexities of socio-cultural, economic, and environmental changes related to food security. Many scholars recognize the strength of IM when working with Indigenous communities, as it involves active participation and collaboration between researchers and community members (Battiste & Youngblood Henderson, 2000; Kovach, 2010; Tuhiwai Smith, 2012). While researchers have been collaborating with community members since 2010, this study is centered on two separate six-week field seasons in the spring and fall of 2018 where researchers learned from a wide range of community members, including Dene and Métis Elders, local government representatives, knowledgeable land-users, and local food enthusiasts. Field research included participation in local food procurement trips, volunteering at local events, and collaborating with community members on various projects. These experiences assisted in building respectful relationships. While IM provides general guidelines, this study was tailored to local values, expectations of reciprocity, and community protocols. This ensured that sensitive cultural information was appropriately protected (Battiste & Youngblood Henderson, 2000).

This research involved semi-structured interviews with 20 community members (nine female and 11 male; Appendix B). Non-probability snowball sampling was used to recruit participants, but local leadership and community champions also recommended knowledgeable land-users and Elders to connect with. Interviews consisted of 15 open-ended questions (Appendix C) that provided participants a degree of control over sharing their knowledge in a culturally appropriate manner, as Indigenous communities in the NT are oral cultures. The interview guide was built in consultation with local leadership and community champions (Appendix B and C). All interviewees are NT residents and represent some of the diversity of motivations, values, perspectives, and opinions that exist within the hamlet of Fort Providence, the Deh Cho region, and the NT. All interviews were conducted between September and December of 2018. The overall objective of the interviews was to identify current adaptive

capacities and local perspectives regarding community-wide resilience to climate change. Direct quotations from interviewees are integrated in the text below to provide evidence in the words of community members.

Results and discussion

Considering constraints to adaptation

Adaptations to climate change are adjustments of a system in order to moderate the impacts of climate change, to take advantage of new opportunities, or to cope with consequences (Adger et al., 2003). It must be emphasized that human communities are a critical part of this system and any modifications to it. Indigenous peoples have relied on their regional ecosystems for subsistence and autonomy, and, over many centuries, they have formed complex relationships with their local ecosystems, and adapted to changing ecological conditions, while sustainably managing resources (Mazzocchi, 2006). This dynamic relationship is being disrupted for communities across northern Canada by shifting environmental conditions, which affect local ecosystems, species, and subsistence practices. Climate related changes in Fort Providence, compounded by socio-cultural and economic barriers, represent challenges for adaptation strategies and frameworks (Appendix D). Given that unstable environmental conditions will be expressed in unpredictable and irregular ways, adaptation policies targeted at reducing vulnerabilities to current climatic risks will inherently help to reduce vulnerabilities to future changes (Ford & Smit, 2004).

Young Dene woman Christina Bonnetrouge (personal communication, 2018) explains, “the weather has been unpredictable… we’re already seeing a decline in the animal populations...these are all factors for land-users.” As discussed by all Fort Providence community members interviewed in this study, local food procurement activities are currently being threatened by a number of interrelated factors related to climate change. Michael McLeod (personal communication, 2018), Member of Parliament for the Northwest Territories, points out that climate change has caused major concerns regarding ice conditions and water levels, but also that the socio-cultural milieu of the North adds a layer of complexity to the problem:

> Climate change has made a big impact in the North. It has caused a lot of concern around the issue of safety when out hunting, fishing, gathering berries or whatever. We now have ice conditions that are different. We have more storms... bigger storms. We have forest fires...huge forest fires. We have new animals and new bugs that are making their way north. It's caused people to hunt less...people are spending less time out on the land, which is resulting in diminished knowledge. Our culture is based on passing our history on, down through generations. Our history is oral. So, people are losing the ability to be able to tell you where to find a good berry patch. They're forgetting where the historic sites are, the best migration

> routes for different animals, or when the fish are running.... Those things are starting to really become eroded. It's causing a lot of concern. We are starting to see a disconnect between the Elders and the youth...we used to turn to our Elders. All of that traditional knowledge, we need from our Elders. Now...things have changed so much. It's really challenging our culture…you lose a language, you lose traditional skills, and you end up losing it all.

As remote northern Indigenous communities attempt to address the many socio-cultural, economic, and environmental challenges present, the importance of engaging in local food procurement activities remains vital in order to support food security, mitigate the impacts of climate change, and encourage cultural practices. Throughout the course of the interviews, it was noted that wild foods are becoming increasingly difficult to acquire due to a number of factors. Some interviewees recalled a time when there were ample wild foods available:

> They used to get hundreds of these muskrats. They used to gut them and dry them, and after you boil it. Oh my goodness, they were so tasty! I can just see it you know...all the dry fish and dry meat. Every camp also had a big boiling pot of ribs and beaver meat, ducks, geese, just everything you could think of. Everyone also had fresh bannock! (L. Sabourin, personal communication, 2018)

Many interviewees reminisced about the drastic changes to wild food harvesting. As Elder Joachim Bonnetrouge (personal communication, 2018) explains, "for traditional foods, it's been a real struggle for the last 10-15 years…especially the last few years, there's hardly any moose." Elder Theresa Bonnetrouge (personal communication, 2018) adds, "you have to practically go hunting every day…and nobody is going to give you that much meat…moose meat is hard to give out because nobody goes out that often which means we usually don't have a lot of it." The steady decline of wild foods in Fort Providence residents' diets correlates to a number of environmental and socio-economic factors. For example, the negative impacts of forest fires, the introduction of new diseases to local big game populations, and the increasing economic costs associated with harvesting all put stress on local food procurement. Elder Joachim Bonnetrouge (personal communication, 2018) explains:

> Two years after the bad anthrax outbreak, we were devastated by forest fires. For the traditional economy and food, it's just added more stress, more challenges.... If you really wanted a moose, you would have to pick your boat, get some food and you pretty well have to go about 100 miles down the river, or if you go up the river, you're dealing with the shallows. But you pretty well need to do that. It's a big commitment...and you still need income.

As highlighted in this quotation, in addition to the significant time commitment required and the economic investment in equipment and supplies, land-users need an income to be able to afford

procuring foods from the land. This does not include the economic costs associated with adaptation requirements to ensure safe land-use. As shifting environmental conditions exacerbate ongoing land-user safety issues, technical equipment, such as satellite phones, can be purchased as an adaptation tool to reduce risks. However, due to limited economic capacity in many small, remote northern Indigenous communities, such strategies remain out of reach for many. This suggests the need to enhance finance mechanisms to help cover the costs of adaptation for land-users. The caveat to this is that technology does not reduce vulnerabilities directly, unless an individual possesses the ability to use and adapt to the technology (Ford et al., 2010). This indicates that autonomous coping responses must be combined with governmental assistance through funding, training, adaptation frameworks, and policies to enhance on-the-ground responses to shifting climatic conditions. Residents must continually adjust local food procurement activities to support overall food security, cultural continuities, and resilience.

Identifying adaptive capacity to climate change

A combination of local food procurement activities will support food security and adaptive capacities, as the community must adjust food procurement activities to confront the manifestations of food insecurity and to cope with the unpredictable impacts of climate change. As Michael Nadli (personal communication, 2018), Member of the Legislative Assembly for the Deh Cho, points out:

> One of the strengths of the community of Fort Providence is in some ways and the people from the community don't see it themselves...but it's their resilience. The resilience of the people here. When they go out hunting and trapping, they're really good at it. They're very skillful, it's just a natural gift for them to do that. Their traditional skills are very strong. It can be a reflection of the defiance to the governmental system or a reflection of survival mode, to say 'I'm not going to feed my kids pork chops, steaks...when we can eat wild chicken, beaver, or moose meat!

In spite of the many barriers present, community members still engage in local food procurement, which acts as an important food security activity and a culturally meaningful practice. Warmer temperatures and changing ice conditions, for example, indicate that land-users are adjusting their harvesting habits to reduce the risks associated with erratic environmental conditions. Long-time land-user Albert Nadli (personal communication, 2018) explains the ways in which he adjusts his land use to cope with shifting environmental conditions: "I fish more now. But there's lots of ways in which we adapt. Sometimes, if we don't have that much moose, we will get more bison tags, or at least it feels like that." This is an autonomous adaptation response which is being generated from the ground up, serving as an example of the flexibility of a land-user who takes into account shifting migratory patterns or potential environmental hazards. Adaptability is the process of continual learning, by readjusting and improving skills

that are gained through personal experiences and transmitted across generations to create a wealth of opportunity and a breadth of cumulated knowledge (Pearce et al., 2015). Another example of adaptability is food sharing, as Métis male, Mike Leishman (personal communication, 2018) explains: "My mom brings over traditional food…like fish and other freshly harvested meats. It is mostly my family from Kakisa [community situated on Kakisa Lake, 70 km to the southeast] that will bring us foods." Almost all (18/20 or 90%) interviewees explicitly indicated that they share food within their family units and extended kinship networks. While it is imperative to note that cycles of plenty and drought have always impacted resources, land-users possessed the knowledge, in terms of processing the meat and hide, to ensure that every aspect of the animal was put to use. However, research has noted disruptions to Indigenous food systems derived from colonial policies that specifically targeted Indigenous educational practices as well as subsistence land uses (Mason, 2014). As traditional food-based knowledge erodes in northern Indigenous communities, harvesting households tend to distribute foods in particular patterns or kinship networks. This is based on families sharing amongst themselves or with other harvesters. In Fort Providence, some community members can be missed in the food distribution network, such as Elders or single-mother households who cannot regularly access wild foods, or family units where substance abuse or chronic disease have negative impacts (Charlene Bonnetrouge, personal communication, 2018). Governmental approaches to food security issues in the NT include formalized programs and initiatives; however, top-down approaches do not always reflect the specific and unique nature of the communities and individuals they are attempting to include (Ebi & Semenza, 2008). For northern subsistence harvesters without full-time employment, the economic adaptation requirements to address the risks of climate change can sometimes be too high to manage. Thus, governmental assistance of harvesters is a critical component of providing a safety net for households, in order to help harvesters recover from climate-related losses and provide financing for adaptation (Ford et al., 2010). This indicates the importance of strengthening existing harvesting programs and developing new frameworks and policies that reflect community adaptation requirements, but also ensuring that community members are able to access the support. As Albert Nadli (personal communication, 2018) explains:

> I just heard on the radio, harvesters can put an application in to help with gas.... So, that's one way [governmental programs] are helping. But, if we could get someone that knows more…to help us. Get someone to get more information on it…we don't use all the programs.

This quotation outlines some of the human resource-based and technical challenges that occur in rural northern communities. Current programs can be improved in a number of ways, such as through increased financial resources, better communication of program requirements, or support for the application process. Moreover, building in a climate change adaptation dimension and a transmission of knowledge component remains a critical piece in policy and program development. For Indigenous peoples in Canada, food insecurity is rooted in colonialism,

including the legacy and cumulative effect of colonial-style governmental policies, residential schools, and race-based legislation (LeBlanc & Burnett, 2017). Facilitating local food systems which stimulate cultural resilience to climate change is one way to further enhance community adaptive capacity. But, as retired school principal Lois Philip (personal communication, 2018) explains, some barriers remain:

> In a sense, there is an increased sense of bureaucracy. I suspect that some of the policies and procedures put in place to be very aware of risk management, are actually hindering the process...something like criminal records checks, which if you look within a residential school context, has tremendous limits. It's a very...what's the right words...it's not really indicative of who the communities are. When we are dealing with multi-generational trauma, and then you get some bureaucrats that put these policies and procedures in place, hindering our students from being able to go out versus supporting them. Policy privileges a voice and whenever you are dealing with systemic privilege, you almost need to step into that quagmire of chaos and say: okay, what's really important here? You go to the communities directly and you ask: what is really important for you?

As Philipp suggests, top-down blanket approaches, like regionally or nationally implemented programs, do not always directly meet community needs. To circumvent the top-down approach, funding bodies must allow communities more flexibility to allocate program resources in ways that best support local need, as currently funded programs are not always doing enough to support the adaptation component needed for the stability of long-term local food procurement. While these funding opportunities do have drawbacks, when used in innovative ways and in combination with local champions and organizations they can be effectively tailored to local needs. For example, there are currently a number of successful land-based programs locally directed by the Deh Gáh Elementary and Secondary School in Fort Providence that are funded by the territorial and federal governments. These programs are locally driven and reflect the needs of the community in terms of the transmission of traditional and academic knowledge, thereby reducing cultural erosion by supporting continuities:

> In our primary programs the kids spend three to four weeks [out on the land], split between a winter and a spring camp. Those are all day trips, with a focus on land-based foods. The winter focuses on the hunting and trapping and the spring focuses on fish camps. When we get into elementary and junior high, it's all overnight camps. They will be out for two or three weeks. In terms of the long-term benefits, it's giving our kids the opportunity to really experience a lot of cool outdoor opportunities, which ultimately leads to their academic success. (L. Philipp, personal communication, 2018)

This clearly demonstrates the benefits of formalized land-based programs, which are directed by local needs and priorities. The impacts of these programs include capacity-building for increased

food access as well as socio-cultural ramifications that include relationship-building, knowledge transmission, and cultural continuity (Wesche et al., 2016). Positive perspectives on these school programs were unanimous among interviewees (20/20 or 100%), who explained their long-term benefits. For example, past student Bradley Thom (personal communication, 2018) reflects: “I feel like I personally wouldn’t know how to skin a moose if it wasn’t for the Deh Gáh School allowing me to go out on the land with Elders who taught us all of that.” Local high school science teacher Nimisha Bastedo (personal communication, 2018) explains, "for some of the kids, the school has been their main exposure to fixing wild game.” Elder Laura Sabourin (personal communication, 2018) adds:

> A lot of those kids get to have meaningful experiences, it will stay with them. A lot of them, that don't usually go out, and will get a chance to learn how to pitch a tent and put spruce bows on the ground. With the smaller, younger groups that's exactly what we do, and traditionally, that's what our people did, by having our kids watch.

It is not just the Deh Gáh Elementary and Secondary School that coordinates these land-based programs. Governmental initiatives implemented by the government of the Northwest Territories (GNWT) include, for example, the Take-A-Kid-Trapping Program. This program pairs with local schools across the NT to introduce youth to trapping by funding localized initiatives. As Theresa Bonnetrouge (personal communication, 2018) describes:

> The kids go out with an Elder from the community who shows them how to set different traps. In the wintertime, we went to check the beaver trap with some kids. The guys are fixing the beaver and the kids are just sitting there watching and they say: oh, this is the hand…this is the teeth! Then they all wait around until you're finished cooking the beaver tail. Everybody waits for the beaver tail!

This territorial partnership takes into account the needs and capacities of the community in order to provide foundations for success in a localized context (Wesche et al., 2016). Clearly, as demonstrated through many community members’ experiences, these programs are successful and extremely beneficial, both for community-wide resilience and for building local technical capacities. Nonetheless, climate change continues to aggravate the shortcomings in funding allocations, and future impacts will further increase pressures on support programs (Ford & Smit, 2004). Moreover, as formalized programs typically require tangible results, this can be problematic at the local level where there are positive yet unmeasurable cultural outcomes. Indigenous youth in northern communities are spending less time involved in subsistence activities beyond organized land-based camps. This has resulted in fewer opportunities to learn hands-on knowledge and to gain skills necessary for safe and successful local food procurement practices (Pearce et al., 2015). Therefore, the importance of maintaining and increasing funding

for flexible government programs, like Take-A-Kid-Trapping, is an important short- and long-term strategy to cope with socio-cultural, economic, and environmental challenges.

In the context of contemporary Indigenous communities, key determinants of adaptation include the ability to cope with and adjust to biophysical changes that affect subsistence food practices. This is associated with a profound knowledge of the local ecosystem and harvesting skills, which allow land-users the ability to make dynamic and flexible use of the shifting environment and available resources (Pearce et al., 2015). Local autonomous adaptation strategies, in combination with formalized governmental policy initiatives, are key to address the complexities of shifting environmental conditions and food insecurity. This suggests the need for a multifaceted approach to address the different pillars of food security, while dynamically instituting initiatives that directly support localized food procurement strategies, cultural continuities, and community-wide resilience to climate change.

Across the North, Indigenous peoples remain intimately connected to local ecosystems, which creates susceptibilities to shifting environmental conditions with widespread implications for human-environment relations and vulnerabilities (Ford et al., 2006). Given the potentially serious risks associated with climate change, a considerable effort is underway to understand adaptation while mitigating the effects of changing environments (Adger et al., 2009). These efforts include both formalized institutional and local autonomous responses. In Fort Providence, community members proposed a range of adaptation strategies and ways forward throughout the course of interviews, which included selling wild foods locally, sharing food in community freezers, growing foods locally, increasing funding and flexibility for food-based cultural programs, and adjusting harvesting strategies to adapt to climate change. This demonstrates that the community is continuing to build adaptive capacities to climate-related changes while supporting food security initiatives and cultural continuities.

Local food production models

In northern Canada, climate change adaptation strategies have been largely short-term, ad hoc, and reactive in nature (Wesche & Armitage, 2014). In the NT, vast territories of land remain uninhabited and remote, and this indicates that economic, technical, and infrastructural capacities will struggle to address long-term formalized adaptation strategies. Many small and isolated northern communities lack the necessary resources and overall capacity to address compounding climate-related changes already underway. Jason Collard (personal communication, 2018) describes local food production activities underway in Fort Providence to support adaptive capacities to climate change:

> There’s lots of exciting things happening with hydroponics, aquaponics or container growth systems. It's all possible, but it's about building that capacity to start with. Like why leafy green is what everyone starts with

> [in an aquaponics system] is because there is such a low margin for error. You can grow conceivably everything, but you have a much larger margin for error without the experience or technical capacity. You are going to end up with a greenhouse full of rotten plants. That's not good for building a sense of what's possible. Now by the same token, having more parsley than we can shake a stick at isn't great for selling this idea either!

Collard highlights the intricate balancing act involved in adapting northern food procurement activities. On the one hand, for any food-based activity to be successful, there need to be positive outcomes. As leafy greens are not a staple of local Indigenous people's diets, having too much parsley, as Collard suggested, is not going to help address food insecurity either. The aquaponics system currently underway in Fort Providence is part of a long-term vision for building community capacity and ultimately food security in the North (Jason Collard, personal communication, 2018). Community-led projects, ideas, and solutions are critical, because what works in one community will not necessarily work in another. This is due to a wide range of factors, including leading roles taken on by local champions, community priorities or preferences, and overall technical, economic, and infrastructural capacities of a community. A local aquaponics volunteer explains:

> I know there has been interest in growing more food locally. This aquaponics project is just a demonstration project to show that it is possible to grow food locally and throughout the winter. Eventually, the idea is that people who help out can take home some of the vegetables that will grow in it. (N. Bastedo, personal communication, 2018)

The aquaponics project currently underway is building capacity at a community level in order to promote what is truly possible with regard to growing foods in the North. This implies that strengthening community technical capacities in relation to local food procurement will increase overall community resilience to environmental changes and food insecurity. Unfortunately, current infrastructural and economic capacities remain limited. Some of the early challenges facing northern communities, when starting up any agricultural system, are the lack of economic, technical, and infrastructural capacities, in terms of funding, agricultural expertise, and physical spaces for agricultural activities. Despite the lack of local technical, economic, and infrastructural capacities, food procurement initiatives, such as the aquaponics system, reduce stressors associated with climate change by supporting community resilience and adaptive capacity-building. A few community members are involved with the aquaponics system, but all described a number of barriers and setbacks, such as hefty regulations that took longer than expected to navigate, issues with heating, and delays with transporting key aspects of the system north. Regardless of these challenges, many (16/20 or 80%) participants expressed excitement for the project's potential. As Thom (personal communication, 2018) notes:

> I feel like aquaponics will take off in the community, because it can go year-round. We can make it sustainable with solar panels and all of that.

> We would have such local diversity, in combination with fishing and going back out to the traditional trap lines.

Across the North, unique and innovative food procurement strategies are being employed to support food systems, combat manifestations of food insecurity, address stressors associated with climate change, and boost cultural activities (Nunavut Food Security Coalition, 2014). Erratic and unpredictable weather patterns as a result of climate change will increase in the future, which becomes problematic for agricultural opportunities and damaging for local food procurement. This is where innovative solutions to growing food locally come into play. Indoor closed systems like aquaponics are not reliant upon environmental conditions. This could be useful for the community to increase freshly produced, sustainably grown, and locally cultivated foods, which can have positive effects on overall community health and decrease reliance on market foods:

> The GNWT has been doing really great for advocating for gardens, community gardens, and personal gardens. People are starting to see the benefits of it, and it could work, you know. It could work. (M. McLeod, personal communication, 2018)

As demonstrated in this quotation, there is substantial potential and opportunity for growing foods locally. Over half of the interviewees (12/20 or 60%) specifically commented on the rich soil around Fort Providence that could be used for food production. The community views this as an opportunity to adapt to the impacts of climate-related changes. With the number of growing days expected to increase, the Canadian Subarctic presents an opportunity to investigate the potential for local, sustainable food production (Barbeau et al., 2015).

However, it is also important to note that economic constraints represent a barrier to future agrarian opportunities, especially in northern regions where seeds, soil, and equipment must be imported (Barbeau et al., 2015). As Fort Providence's Chief, Xavier Canadien (personal communication, 2018), states: "we need resources…funding is a major barrier." Regardless of the economic viability of a community greenhouse or garden, there is certainly no lack of enthusiasm with regard to growing food locally. However, not every community wants a garden or greenhouse, which emphasizes the importance of tailoring adaptation strategies to specific communities in order to achieve long-term sustainability:

> My friend worked doing a community garden project that was going down the Mackenzie River. She said they would drop off a bunch of stuff to help start up a garden. Sometimes, they would stick around for a few days to help but then would leave. She would come back later in the summer to find out that no one had looked after the garden. You know you really need to talk to communities first to see if they even want a garden or what they want to plant so that they will eat it. (N. Bastedo, personal communication, 2018)

This quotation supports the need for local voices in decision-making processes. Interventions into food insecurity should be framed by local community members' voices, while modifying adaptation strategies to best suit the needs, priorities, and strengths of individual communities. Intervention by different levels of government is necessary to enhance existing climate risk management strategies and to create an enabling environment for adaptation policies (Douglas et al., 2014; Ford et al., 2010). It is also crucial to note that, in order to create effective policy solutions, ideas must be attempted, reworked, and continually adapted. Without the incorporation of local voices into adaptation strategies, governmental initiatives will ultimately fail to address the real concerns around localized northern food insecurity.

Conclusion

Despite the existence of current scholarly interest in food security and community resilience in the Subarctic (Barbeau et al., 2015; Robidoux & Mason, 2017; Rudolph & McLachlan, 2013; Thompson et al., 2018; Wesche et al., 2016), there has been limited research highlighting local food procurement activities and community adaptive capacity in the Deh Cho region of the NT (Spring et al., 2018). By documenting the perspectives, experiences, and knowledge of community members, this research can be used to help tailor food procurement activities to meet localized needs. For example, the importance of local food procurement was highlighted in every interview (20/20 or 100%). This is reiterated by studies which demonstrate the significance of wild foods to overall health and cultural well-being of northern Indigenous peoples (Douglas et al., 2014; Gerlach & Loring, 2013; Kenny et al., 2018; Robidoux & Mason, 2017; Thompson et al., 2018). In addition, procuring, harvesting, sharing, and consuming wild foods plays an integral part in local culture and identities. This project considered the socio-cultural and economic aspects of local food procurement, while highlighting the complicated challenges arising from shifting environmental conditions.

Data collected throughout this research revealed that community members are already implementing a range of local food procurement activities to support adaptation to climate change while promoting resiliency in food security activities. Despite the many benefits and risks related to local food procurement, community members continue to adapt to encourage youth initiatives and cultivate local foods. While outlining current food-based procurement initiatives, community members suggested potential strategies for moving forward. These adaptation approaches can support overall community resilience, food security, and adaptive capacities by reducing the stressors associated with shifting environmental conditions. Consequently, this research is timely due to ongoing federal and territorial funding opportunities, localized mechanisms, and the overall excitement of community members surrounding food procurement activities across the North.

Engagement with local residents, who have a vested interest in their own well-being, health, and food security, is needed to ensure that vulnerable communities guide decision-makers

regarding possible ways forward. Traditional knowledge of the local environment is critical to inform decision-making processes. This intimate familiarity with the land is based upon long-term empirical observations suited to local conditions, which enable Indigenous peoples to identify and respond to environmental change (Kenny et al., 2018; Mazzocchi, 2006). Traditional knowledge also plays a key role in overall community resilience to climate change and cultural continuity. This study supports decentralized policy development that focuses on integrating local voices into decision-making processes and program development. This research has demonstrated that autonomous coping responses must be combined with governmental assistance through flexible funding programs, training opportunities, and food-based policies to enhance adaptive capacity to climate change at the community level. As Adger et al. (2003) note, adaptations to climate related changes represent the adjustment of a system to moderate the impacts of climate change and to cope with its consequences. Local food procurement programs in Fort Providence will need to respond to the impacts of climate change to create a resilient community that supports food security initiatives and strategically navigates shifting environmental conditions.

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Appendix A: Regional map – Deh Cho

Fort Providence, NT

61.35º N, 117.66º W

Deh Cho Regional Map (Deh Cho Collaborative on Permafrost, 2020).

Appendix B: Overview of research participants

	Interview Date	Name	Position
1	Sept 13, 2018	Lois Philipp	Dene woman, retired
2	Sept 14, 2018	Brandon Thom	Dene male (18+), young adult
3	Sept 16, 2018	Boris Sanguez	Dene male, GNWT employee
4	Sept 18, 2018	Michael Nadli	Dene male, previous Deh Cho MLA
5	Sept 19, 2018	Bradley Thom	Dene male (18+), young adult
6	Sept 19, 2018	Christina Bonnetrouge	Dene female (18+), young adult
7	Sept 20, 2018	Laura Sabourni	Dene female, Elder
8	Sept 22, 2018	Theresa Bonnetrouge	Dene female, Elder
9	Sept 22, 2018	Nimisha Bastido	Non-Indigenous female (18+), young adult
10	Sept 24, 2018	Xavier Canadien	Dene male, Chief of Fort Providence
11	Sept 24, 2018	Jason Collard	Non-Indigenous, middle-aged male
12	Sept 24, 2018	Mike Leishman	Métis male, vice-principal at local school
13	Sept 25, 2018	Gladys Norwegian	Dene woman, Grand Chief of the Deh Cho
14	Sept 26, 2018	Albert Nadli	Dene male, harvester
15	Sept 26, 2018	Charlene Bonnetrouge	Dene woman, single mother
16	Sept 27, 2018	Michael McLeod	Métis male, MP of the NT
17	Oct 10, 2018	Joachim Bonnetrouge	Dene male, Elder
18	Nov 15, 2018	Marg Henderson	Non-Indigenous, middle-aged female
19	Nov 16, 2018	Alex Arychuk	Métis male, retired
20	Nov 16, 2018	Pamela Richardson	Dene woman, middle-aged stay-at-home mother

Appendix C: Interview guide

1. Can you tell me your name, age and number of years you've lived in Fort Providence?

2. In general, can you tell me about the types of food that are usually found in your household?
    a. Prompt: Is it mainly wild or grocery store foods?
    b. Prompt: What is your favorite type of food?

3. Can you tell me about wild foods in your household?
    a. Prompt: What types of wild foods do you mainly eat, and how often do you eat them?
    b. Prompt: Has there been changes in the availability of wild food sources?
    c. Prompt: Do you eat more or less wild foods now than in the past?

4. (If applicable) How often do you get out on the land?
    a. Prompt: Have you seen climate change affecting wild foods?
        i. In which way?
        ii. What have you seen?
        iii. Can you give an example?
    b. Prompt: Have the opportunities for going out on the land changed?

5. Has climate change affected consumption of wild foods?
    a. Prompt: Has there been an increase in store-bought food?

6. (If applicable) What are the biggest environmental challenges that you're experiencing when going out on the land?

7. Do you think climate change will have a negative impact in the future in terms of wild foods?
    a. Prompt: How big of an impact and what behavioral changes would you make to adapt to climate change?

8. (If applicable) Can you tell me about local programs that support you to go out on the land?
    a. Prompt: What specific programs do you find effective?
    b. Prompt: In your opinion, in the past, what programs were unsuccessful?
    c. Prompt: What type of program do you think would be successful and effective in helping community members get out on the land?

9. What type of support would you like to see in order to help more people go out on the land?

10. What is the significance for you, your family, and your community to continue to eat wild foods?

11. Have you taken adaptation measures to protect wild foods? What type of measures? How time consuming or costly are these measures?

12. Can you tell me about store-bought foods, and where you usually shop?
    a. Prompt: Do you ever grocery shop in Yellowknife, Hay River or elsewhere?
    b. Prompt: Based on your years in the community, have prices of grocery store foods changed?

13. What are some of the programs or strategies in Fort Providence that support local food harvesting, growing or distributing? In your opinion, are these programs successful?
    a. Prompt: Can you tell me about what types of programs you are specifically involved with?
    b. Prompt: Tell me more about your roles in these programs?
    c. Prompt: How did you initially become involved with this program?

14. From your experience, what are some of the main barriers to local food programs?
    a. Prompt: In your opinion, what are some of the ways to address these barriers?

15. What types of programs or strategies do you think would be effective in helping support community members' needs to access culturally relevant foods?

Appendix D: Barriers table

Barriers to local food procurement in Fort Providence, NT

Activity	Barriers
Aquaponics	● Lack of technical capacity, knowledge and experience with this system. ● Infrastructural challenges (energy issues; lack of location options; system was built from a model put together by local volunteers). ● Economic constraints (lack of funding; expensive to start up and to maintain). ● Complicated regulation processes. ● Transportation issues to get parts of the system to the community.
Gardens / Greenhouses	● Lack of infrastructure in the community (a new garden/greenhouse would have to be built with watering system). ● Economic constraints (lack of funding; expensive to initiate and to maintain). ● Requires community champions and dedicated volunteers.
On-the-Land Programs	● Human resource and program application challenges (unaware of programs; lack of technical capacity to apply for funding opportunities). ● Bureaucracy and policy restrictions with some government funded programs. ● Rigid program funding allocation directions. ● Top-down programs can exclude the communities they are intended to serve. ● Requires dedicated community volunteers.
Wild Food Procurement	● Climate change, unpredictable weather conditions, safety issues, etc. ● Lack of access to critical technological and equipment. ● Eroding land-based knowledge. ● Expensive harvesting specific equipment and maintenance.

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Original Research Article

"They hold on tight to the healthy eating, we hold on tight to our food safety, and how do we bridge that?": Determinants of successful collaboration between food safety and food security practitioners in British Columbia, Canada

Kelsey A Speed[a*] Samantha B Meyer[a] Rhona M Hanning[a], Karen Rideout[b], Melanie Kurrein[c], Shannon E Majowicz[a]

[a] University of Waterloo
[b] Karen Rideout Consulting
[c] BC Centre for Disease Control

Abstract

Food safety and food security are two important public health sectors within Canada, which aim to address foodborne disease and food insecurity, respectively. While these sectors are often siloed within public health organizations, the actions of the two sectors often interact and conflict at the program level despite their common goal of improving population health. The objective of this study was to identify determinants that influenced the success of collaboration between practitioners of the two sectors in British Columbia (BC), to inform Canadian food policy. We inductively analyzed 14 interviews with practitioners working in the two sectors who had experience with successful collaboration. Data were interpreted in consultation with an inter-professional collaboration framework. Participants identified determinants at the systemic level, including the cultural, professional, educational, legislative, and political systems, which were often considered barriers to collaboration. Participants also identified determinants at the organizational level that influenced the success of collaboration between the sectors, including: the organization's structure and philosophy, leadership, resources, and communication mechanisms. Finally, participants identified interactional determinants as ways to overcome

*Corresponding author: kspeed@uwaterloo.ca
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existing barriers, including: willingness to collaborate, trust, communication, mutual respect, and taking a solutions-oriented approach. Practitioners working in food safety and food security can apply the interactional determinants identified in this study to mitigate existing barriers to collaboration and support more synergistic food policies.

Keywords: Food safety; food security; public health; qualitative research; cooperative behaviour

Introduction

There is emerging evidence that food safety and food security efforts are interconnected (Speed, et al., 2017), but what this means for food policy is unclear. Historically, efforts to improve food safety and food security have occurred separately and have been delivered by different sectors within the public health sphere. Specifically, food safety (ensuring that food is free from contamination and safe to consume) has traditionally been the purview of environmental health divisions. Food security (ensuring that people have adequate "access to sufficient, safe, nutritious food to maintain a healthy and active life" (Food and Agriculture Organization, n.d.)) has traditionally been the purview of health promotion divisions. This separation can be problematic because the policies and programs within one sector can have unintended consequences for the other sector (Speed et al., 2017). For example, BC's Meat Inspection Regulations (Food Safety Act: Meat Inspection Regulation, 2004), were developed to ensure safe meat production, but reduced the ability of remote communities to produce their own meat, thereby reducing their food security (Miewald, et al., 2015; Miewald et al, 2013).

However, there is limited research on how to support collaborations between the two sectors, to ensure that policies and other actions are not accidentally countering each other. Martin and Perkin (2016) explored how to reduce existing tensions between the sectors in Canada, finding that "communicating," "understanding intent," "educating," "understanding risk and regulations," "recognizing scale," and "enhancing partnerships" are key to reducing tensions. Our work extends these findings by identifying the factors that facilitate, or are barriers to, successful collaboration (hereafter collectively called "determinants"), between food safety and food security practitioners in BC, Canada.

Methods

We analyzed transcripts from semi-structured telephone interviews (see also Speed et al., 2017), conducted in January and February 2015 with 14 purposely-sampled key informants working in public health in BC: five working in the food safety sector (certified environmental health officers [EHOs], managers, and directors of health protection and environmental health departments); six in the food security sector (community nutritionists and public health dietitians

[hereafter called collectively "dietitians"], and project leads); and three who brought both perspectives (from positions previously listed). We obtained ethics approval from a University of Waterloo Research Ethics Committee for this project, and recruited participants through email. After receiving verbal consent, we asked participants about their experiences working with practitioners in the other sector using a semi-structured interview guide. The interviews covered multiple domains, including ways in which the food safety and food security sectors intersect (Speed et al., 2017), as well as determinants of successful collaboration between the sectors (reported here). The audio files of the interviews were transcribed, cross-checked, and anonymized prior to analysis.

We continued recruiting participants until no new concepts emerged (Guest et al., 2006). Data were inductively analyzed as per DeCuir-Gunby, Marshall, and McCulloch (2011) and Braun and Clarke (2006), and were managed in ATLAS.ti version 1.0.50 (282) (ATLAS.ti Scientific Software Development GmbH, 2013-2016). A list of initial codes was developed through open coding, to identify key words and sections of the text that were relevant to understanding determinants of successful collaboration as perceived by the participants, following immersion in the data. The initial codes were revised based on an inductive analysis of seven of the 14 transcripts and were then compiled into a draft codebook containing each code's name and detailed description. Two individuals separately coded three transcripts, and individually identified quotes that they felt exemplified each code for the sake of comparison and discussion. Any disagreements in coding were used to refine the definitions of the codes, and to create new codes. The codebook was iteratively revised while coding all 14 transcripts, by refining existing codes and adding codes as they developed. Four of the authors provided input into the coding process and codebook development, and the codes and their definitions were then revised.

In order to identify the determinants of successful collaboration, the codes were then arranged into categories based on the inter-professional collaboration framework from San Martin-Rodriguez, Beaulieu, D'Amour, and Ferrada-Bidela (2005). The framework outlines factors influencing successful collaboration in health care teams. First are the *systemic* determinants, which "…are elements outside the organization…" (p. 134); these include the social system, the cultural system, the professional system, and the educational system. Second are the *organizational* determinants, which are the conditions within the organization; these include the organizational structure, the organization's philosophy, administrative support, team resources, and coordination and communication mechanisms. Last are the *interactional* determinants, which are the "…components of interpersonal relationships among team members…" (p. 141); these include willingness to collaborate, trust, communication, and mutual respect.

Results

Public health practitioners from the food safety and food security sectors in BC, Canada, identified a range of systemic, organizational, and interactional determinants that influenced successful intersectoral collaboration. In general, systemic determinants were more likely to be identified as barriers to collaboration, and interactional determinants were more likely to be identified as facilitators to collaboration. Participants identified organizational determinants as both barriers and facilitators to collaboration, depending on the priorities of the organization.

Systemic determinants

Participants in both sectors identified systemic determinants that influenced the success of collaboration between the two sectors; they discussed these determinants as environmental conditions that they had to navigate, and often considered them as barriers to successful collaboration. Participant accounts were indicative of all but one of the systemic determinants outlined in San Martin-Rodriguez et al.'s (2005) framework: the social system. Two additional determinants, not accounted for in the existing framework, were identified; the legislative and political systems. The systemic determinants outlined in San Martin-Rodriguez et al.'s (2005) framework and identified by the participants are provided in detail in Table 1, with their definition and quotes from participants demonstrating the impact of the determinant.

Table 1: Systemic determinants of successful collaboration between food safety and food security public health practitioners

Determinant	Definition	Exemplifying quote
From the San Martin-Rodriguez (2005) Framework		
The Cultural System	"Specific cultural values may also have an impact on the development of collaboration between professionals" (p. 134).	"[…] the huge smiles on the faces of kids as they're pulling carrots out of the garden, and eating kale flowers off the kale plants, doesn't have quite the impact on the politicians, and the media, and the people that don't have the health background that are often, or not often, but, some of those upper level that are making those decisions, it has a big impact because they don't understand that upstream population health, and the, in terms of the cost savings, that it's not as direct as the knee surgery and the cost of hospital beds, and emergency rooms visits and so on […]" [P5, dietitian].
The Professional System	"…the process of professionalization is characterized by the achievement of domination, autonomy and control, rather than collegiality and trust" (Freidson, 1986, p. 136, in San Martin-Rodriguez et al., 2005).	"[…] basically, Canada's Food Guide is a national guideline. […] For healthy eating in Canada, and provincially we use that as a tool, and everybody is implementing working towards healthier food choices. […] So, you can't trump that. You can't say, 'kids can't eat salads, because they're dangerous'" [P2, food security lead].

		"I think that it's probably not the legislation as much as the historical practice of being law enforcement type people, and that there's a lot of people that have to follow the law, and that's our job, to make sure that the law is being followed" [P9, manager, health protection/environmental health].
The Educational System	"The literature presents the educational system as one of the main determinants of interprofessional collaborative practice, because it represents the principal lever for promoting collaborative values among future health care professionals" (p. 137).	"For a lot of us working in food security where, at the community nutrition level, we have to do food safety as part of our training. I'm not sure what EHOs do around food security in their training, if anything, or what their training is around healthy eating" [P8, manager, food security].
Additional Determinants		
The Legislative System	The legislative environment mandates public health activities, which can limit inter-sectoral collaborative efforts.	"Making changes to legislation is an extremely difficult thing to do. […] Unless there's a real political will to get it done, it moves at a snail's pace, and I'll be honest with you, to try to go through the legislative change route, I mean we'd still be, I'll say banging our head on the wall" [P14, food safety expert].
		"[…] we sent a letter to all of our facilities saying, 'regulations say all your foods have to come from an approved source. A local garden is an approved source for your vegetables,' whereas, so everybody thought they had to go to a big store to get their potatoes. Well, no, the local guy grows potatoes is good for your potato source, so, we made it an option for them to do the kind of things that they want to do" [P12, EHO].
The Political System	The short-term political environment sets the priorities regarding the health of the population, and resources are then allocated (including time, money, and personnel) according to these priorities.	"[…] people don't have that long-term view, particularly when you have politicians that are in for four year terms, and their whole purpose is getting - not their whole purpose, but one of their key purposes is getting themselves re-elected, and so it's in shorter term chunks versus that longer term […] I just don't think that long-term view is often captured when you have politicians that are making decisions about where the money goes" [P5, dietitian].
		"[…] someday a political wind will change without any warning, and all of a sudden, if you stuck to it, you'll have everything ready, and that will make a big difference in your ability to communicate key points. So, just keep working away to be that thirty-year overnight success. (laughing) That's what it takes. You just have to keep plugging away and sooner or later, things change" [P11, dietitian].

Participants in this study discussed how government budgets prioritize spending on acute health care (an immediate need that is felt by the public), over disease prevention and health promotion, and both food safety and food security practitioners identified this cultural value as a barrier that limited resources available for their activities. Both sectors felt that limited resources reduced their ability to participate in collaborations, as collaborations take resources and the sectors do not have any to spare. Further, participants discussed how this cultural value of prioritizing activities that have short-term, measurable, and clear impacts over those with longer-term and more distal impacts also creates tension between the two sectors, because food safety

efforts (e.g., the Hazard Analysis and Critical Control Points [HACCP] program) often produce more immediate and clearly-linked outcomes than do food security's health promotion activities (e.g., farming workshops with school-age children):

> So, everything else falls to the wayside, unless you have something that has that measurable effect on health, and it's so hard, when you're doing upstream work in population public health, to show that, 'you know what, when we actually do these workshops, and the students are exposed to, and learn how to grow, and so on, these are the outcomes that we can measure and say, we have to have this time to do this work, because look at what the results are.' It's really hard to measure those interdisciplinary, population health, upstream initiatives. [P5, dietitian]

Another cultural value that was expressed by participants in both sectors was that their own position should "take precedent" [P2, food security lead] over that of the other sector due to their own importance or legitimacy. This was a barrier to collaboration because this perception of domination limited the willingness of practitioners to work together to reach a compromise. Additionally, participants identified food safety's historical practice of enforcing legislation as a barrier to collaboration, because this enforcement was often seen as dominating and controlling rather than both sectors working together to provide healthy, safe food to the public.

The education system was identified as a barrier due to the differential nature of training of the two sectors. Food security practitioners spoke about being taught food safety, whereas food safety practitioners did not identify learning about food security (something that food security practitioners raised as an issue). This lack of knowledge on the importance of food security was seen as a barrier to collaboration and kept food safety practitioners within their silo.

The legislative system was strongly identified here as a barrier to collaboration, as follows. Participants from both sectors more easily identified food safety legislation than food security legislation, and the existence and legitimacy of the food safety legislation was the main factor underlying the perceived entitlement of the food safety sector. In addition, some participants discussed that changing legislation is a difficult and slow process. This was a barrier to collaboration because the existing food safety legislation was perceived by some participants to be prescriptive and outdated (where prescriptive legislation "…[dictates] which activities must be done to achieve a desired outcome … and necessarily involve more rigid steps and processes."; Rideout & Oickle, 2019, p. 2). This was seen to limit food safety practitioners' ability to adapt the legislation to address new food security efforts. However, while some participants believed that the food safety legislation prevented collaboration, other participants described how the food safety legislation could be interpreted to support food security initiatives while still following the law, which was a facilitator to collaboration:

> Because really, it's more about their own perception of what's allowed and what isn't allowed under the legislation, and maybe pressure from peers, that, 'oh, you let them get away with this, oh my goodness.' 'They

> need to have six sinks in there if they want to wash properly,' there's some, interoffice, and intraoffice comparisons [...] about what was allowed and what isn't allowed, and how you guide the approval process through that, the normal channels. [P9, manager, health protection/environmental health]

Finally, participants identified the political system, in particular the short-term decision cycle of elected politicians and governments, as a barrier to collaboration, because collaborations often take time before results are seen. Further, participants identified that the political will of those in power determines public health priorities, which could be a barrier or facilitator to collaboration depending on what public health efforts were considered priorities at the time.

Organizational determinants

All 14 participants identified organizational determinants as important to the success of collaborations between the two sectors. Participants discussed how having leadership that supports collaboration, adequate resources for collaborative efforts, and formalized education and communication structures in place facilitated collaboration. Participants identified all of the organizational determinants described in San Martin-Rodriguez et al.'s framework (Table 2) and did not identify any additional determinants beyond the framework.

Table 2: Organizational determinants of successful collaboration between food safety and food security public health practitioners

Determinant	Definition	Exemplifying quote
From the San Martin-Rodriguez (2005) Framework		
Organizational Structure	"According to some authors, successful collaboration between health care professionals requires a shift from traditional hierarchical structures toward more horizontal structures" (Henneman et al., 1995; King, 1990 p. 138 in San Martin-Rodriguez et al., 2005).	"[…] we would have to refer to [the food safety manager] anyway, like when [they weren't] on the [group] to begin with, we would have ideas, and suggestions, and think we were on the right track, but then we'd always have to check with [them] anyway, so like why not just have the person who can make the decision there. It just did go a lot faster" [P3, dietitian].
		"Well, it's 'out of sight, out of mind' too, and we operate in our siloes and we're out doing restaurant inspections, and checking food stores, and following up complaints and that kind of stuff, and we're busy with our own, the food safety side of things, so we don't think about some of the big pictures […] there's more to public health than just the food safety side, and I think if we're looking beyond our silo, we've got to consider these other avenues to improve public health" [P9, manager, health protection/environmental health].

Organization's Philosophy	"The organization's philosophy must support collaborative practice among professionals" (p. 139).	"[…] the culture of collaboration has to be fostered at the leadership level, and then you have to have the time to work out these things, in, kind of, ways that are successful" [P8, manager, food security].
Administrative Support	"…the development of collaboration among team members is facilitated by having leaders who know how to convey the new vision of collaborative practice" (Stichler, 1995 p. 139 in San Martin-Rodriguez et al., 2005), "…who motivate professionals to take up collaborative practice" (Stichler, 1995; Swanson, 1997 p. 139 in San Martin-Rodriguez et al., 2005), "…and who are able to create an organizational setting that fosters collaboration" (Evans, 1994; Henneman et al., 1995; Johnson, 1992 p. 139 in San Martin-Rodriguez et al., 2005).	"Well I think what made it easier is for one, having the high level support, right up to the [senior title], and our [senior title], and [their] manager […] so, when you get support at that level, you get dedicated time, staff time, devoted to working on this, and people identified instead of off side of your desk, working on something. It does become a main project. That was really helpful" [P3, dietitian].
Team Resources	"One of the key conditions for a successful collaborative practice is the availability of time to interact and of spaces to meet" (p. 139).	"[…] that's what's afforded by co-location, is that opportunity, and that ongoing camaraderie that takes away the barriers, and lets you just walk over and say, 'you know, I've been thinking about this [idea]. What do you think?'[…] you have a degree of familiarity with your co-workers, and so that allows you to ask, to be unafraid to ask something complex, or that might go against the grain" [P11, dietitian].
		"Money is important. (laughing) […] public health is a very under-funded area, and so […] this is something that we've struggled with for years, that there is no funding available to get certain initiatives, and so you're always trying to carve off people's time, or off people's desks, or those kinds of things, so, it is always helpful to have a little bit of funding or resourcing to actually do things" [P7, manager, health protection/environmental health].
Coordination and Communication Mechanisms	"Interprofessional collaboration can benefit, in particular, from the availability of standards, policies, and interprofessional protocols; unified and standardized documentation; and sessions, forums or formal meetings involving all team professionals" (Cabello, 2002; Hanson et al., 2000; Henneman et al., 1995; Johnson, 1992; Koerner et al., 1986; Warren et al., 1998; Way & Jones, 1994 p. 140 in San Martin-Rodriguez et al., 2005).	"Also, more recently we've been, practically mandated as a contact for the applications for the Farm to School, because there's grants involved, and now the grant application says, 'you need to talk to your environmental health officer.' […] it's a great thing. […] I think we all, encourage, and are happy to see, the people at a grant stage, come in and talk to us and share information" [P12, EHO].
		"So, 'we hear you that you think food safety's an issue, this is how we're going to address it. Is this okay with you? Would you, think of anything else?' So, you have a conduit of being able to identify issues and solutions in a very pro-active way" [P7, manager, health protection/environmental health].

Food security practitioners discussed how hierarchical organization structures in which the decision-making authority vis-à-vis food safety practices did not rest with front-line food

safety practitioners was a barrier to collaboration. Conversely, participants identified that involving food safety practitioners who "could make decisions on the spot" [P3, dietitian], often managers or other practitioners with authority, facilitated successful outcomes. In addition, participants discussed how the siloing of the sectors within public health organizations could be a barrier to collaboration, as it could limit practitioners' understanding of the importance of the other sector and ultimately prevent practitioners from working collaboratively with other public health sectors.

Participants discussed how the philosophy of the organization influenced how open practitioners would be to collaboration. For example, organizations that applied the legislation prescriptively, directing food safety practitioners to enforce the legislation based on typical procedures (e.g., requiring a specific number of sinks for all food operations) made collaboration difficult. In contrast, organizations that took a more outcome-based interpretation (where outcomes-based legislation "…[specifies] the desired outcome but not how to get there…"; Rideout & Oickle, 2019, p. 2) by facilitating outcome-based problem solving (e.g., using washing bins to meet sanitary requirements) facilitated collaboration. Similarly, participants noted that support from leadership was an important underlying factor of the organization's philosophy and having leaders who encouraged their team members to collaborate with practitioners of other sectors facilitated successful collaboration. However, if those in leadership positions did not promote collaboration, it was considered a barrier to collaboration:

> Just as a director came in and said, 'this [flexible/outcomes-focus] is the way we're going to do things,' somebody else could come in and say, 'no, this is the way we're going to do things. We want back to traditional [prescriptive approach], and, you guys are spending way too much time glad handing these guys [doing food security interventions], let's get out, and do some enforcement,' and that could happen tomorrow too. [P12, EHO]

Participants in this study described that face-to-face meetings and being co-located in the same office as practitioners of other sectors were more conducive to collaboration, but the current siloed environment was a barrier to collaboration. In addition, participants noted that the limited resources available to them for collaboration was a barrier, which was particularly problematic because they also identified that collaborations require adequate access to resources such as time, money, people, and spaces to meet in order to be successful. The limited resources available to participants further impacted successful collaboration between practitioners of the two sectors, as participants identified limited travel funds as a barrier to collaboration by reducing opportunities to meet with practitioners in different offices and areas of the province.

Participants in this study identified coordination and communication mechanisms, including formalized educational structures that could be put in place within public health organizations or projects (e.g., orientation procedures and training, resource documents) or could be completed by public health practitioners (e.g., workshops), as facilitators to successful

collaboration. Similarly, participants identified that enacting intersectoral protocols and practices supported collaboration between the two sectors. For example, P5 (dietitian) explained how requiring EHOs to be involved in the grant process of projects designed to provide healthy food in schools was beneficial for ensuring the success of the project:

> […] the environmental health officer actually has to sign off on the grant so that they're aware that this school is going to be doing things that are encouraging students to grow, and harvest, and get local vegetables, and-fruits and vegetable into the classroom, so that we're working together on that, and it's, by having their signature on the document, it's saying, 'yes, I'm going to be there to support the schools, to ensure that the food is safe.'

These factors facilitated collaboration because having educational structures and resources available for practitioners encouraged understanding the importance of working with other sectors. Furthermore, all of the participants identified that *who* is involved in a collaboration is an important factor that contributes to the success of the collaboration; when considering who to involve in the collaboration, participants identified that it is "crucial to have input from everyone" [P3, dietitian] which referred to the different types of people who will be impacted by, or involved in, the work of the collaboration. The different types of people identified by participants were: practitioners from both the food safety and food security sectors (including from both sectors within a given organization); individuals from different positions within an organization (e.g., front line practitioners, management); and people from different organizations within the province. Having "input from everyone" [P3, dietitian] was a facilitator to collaboration, as it allowed potential issues to be addressed proactively before they caused tension between practitioners. In order to get "input from everyone" [P3, dietitian], practitioners needed to know who to engage with, including individuals in the other sector or people who had previous experience collaborating with the other sector. Not knowing who to engage with, or not knowing in general that a connection should be made, was seen as a barrier to successful collaboration. Practitioners that knew who they could talk to did not recognize that some practitioners might not be as knowledgeable; therefore, they did not recognize that knowing who to engage with was a facilitator to collaboration.

Interactional determinants

All participants in this study highlighted the importance of interpersonal connections between practitioners of the different sectors for successful collaborations. Participants discussed how establishing personal connections facilitated collaborations because it promoted trust between practitioners of the different sectors, enabled problem solving, and stimulated future, larger collaborations. Here, participants identified the same determinants as outlined by San Martin-

Rodriguez et al., as well as an additional determinant: taking a solutions-oriented approach (Table 3).

Table 3: Interactional determinants of successful collaboration between food safety and food security public health practitioners

Determinant	Definition	Exemplifying quote
From the San Martin-Rodriguez (2005) Framework		
Willingness to Collaborate	"…the professionals must be willing to commit to a collaborative process" (p. 141).	"[…] I guess for me, even though, food safety, acute illness are sort of my primary mandate from a health viewpoint, […] you can look at health of the population in different ways, and whatever you can do to improve the health of someone, or a population, […] you should be willing to look at that. It might take a bit of effort, but, in the end, it'll be worth it" [P14, food safety expert].
		"I think I've just found that, over the years, just speaking to different people with different backgrounds, it just has been, yea, I guess, often pleasantly surprised, just knowing that there are other ways of doing things that are still going to result in safe food. […] And just be open to that" [P14, food safety expert].
Trust	"According to Henneman (1995), self-confidence in one's role as a professional is essential, as well as displays of trust toward other professionals" (p. 141 in San Martin-Rodriguez et al., 2005).	"[…] there is a lot to be said by that informal communication, and just working closely together to better understand the context and to trust that, from the food security perspective, that we do care about food safety. We don't want kids to get sick. And to understand, and that trust, I think, is there, and that collegiality can go a very long way" [P8, manager, food security].
Communication	"First, the development of collaborative practices demands that professionals understand how their work contributes to outcomes and to team objectives" (Evans, 1994; Mariano, 1989; Lindeke & Block, 1998 p. 142 in San Martin-Rodriguez et al., 2005) …"and know who to communicate the content of this contribution to other professionals" (Johnson, 1992; Mariano, 1989 p. 142 in San Martin-Rodriguez et al., 2005). "Second, efficient communication is essential, since it allows constructive negotiations with other professionals" (Henneman, 1995; Mariano, 1989 p. 142 in San Martin-Rodriguez et al., 2005). "Finally, communication is a vehicle for other determinants of collaboration, such as mutual respect, sharing or mutual trust" (Henneman et al., 1995 p. 142 in San Martin-Rodriguez et al., 2005).	"And that's something that I've found in my other parts of my work, if people are told why something has to be done a certain way, not just, 'you have to do it this way, and don't talk to me again.' If they're told why, and explained why, then, if it's a logical reason, especially if it's a reason other than, 'because it's in the legislation,' but there's a true food safety reason for it, then most people will kind of like, 'oh, okay I didn't know that.' […] So, they're more likely to accept it, versus just being told, 'well that's what the law says, and you've got to do it'" [P14, food safety expert].

Mutual Respect	"Mutual respect implies knowledge and recognition of the complementarity of the contributions of the various professionals in the team and their interdependence" (Bushneel & Dean, 1993; Evans, 1994; Gage, 1998; King, 1990; Mariano, 1989; Pike et al., 1993; Satin, 1994; Siegler & Whitney, 1994; Stichler, 1995; Way & Jones, 1994; Way et al., 2000 p. 142 in San Martin-Rodriguez et al., 2005).	"Say with the culled game meat, I mean we were getting requests from these municipalities or regional districts, saying, 'hey, we're having all these deers killed, and wouldn't it be nice if we could somehow process and donate the food to the local food bank, or First Nations folks or whoever,' and we're like, 'well yea that would be a good idea because it's high quality food, so let's work together and make sure that it's done safely. So that they don't get sick when they eat the food'" [P14, food safety expert].
Additional Determinants		
Taking a Solutions-Oriented Approach	Practitioners involved in the collaboration need to be able to work towards solutions, rather than focusing on prescriptive processes, to achieve an outcome.	"[…] I think you just, you kind of have to have an open mind [...] when an idea is brought forward, and look for the outcome, and how do you get to that outcome, what are the barriers that are in the way, and what are the possibilities of overcoming those barriers, is there something that can be changed, or an attitude change that may occur that may allow for that barrier to be overcome. Sometimes it's just the change in the way you do business locally, there's not a really a big increase in food safety risk, it's more about how you approach it" [P9, manager, health protection/environmental health].

Some participants discussed that the people involved in the collaboration, rather than the position itself, impacted the success of collaborations. For example, P7 (manager, health protection/environmental health) explained that "sometimes you just get difficult people", and the same project could be successful or unsuccessful depending on the people involved. Essential to successful collaborations was working with practitioners who are "willing to be collaborative" [P7, manager, health protection/environmental health] and who have "an open mind" [P8, manager, food security; P9, manager, health protection/environmental health] including being open to other ways of achieving safe food. Participants explained that multiple factors influenced practitioners' willingness to collaborate, including: past collaboration experiences, feeling a sense of need to address the issue or undertake the work (e.g., to address their primary mandate, to address a relevant or urgent issue), having realistic expectations and recognizing "it's better that they have something than nothing" [P8, manager, food security] (e.g., being reasonable about requirements, compromising, modifying current practices, addressing barriers, and recognizing context), understanding that collaborating with the other sector might be considered difficult or time consuming but was worth the resources because "you're going to end up with a lot better results" [P14, food safety expert], and recognizing that collaborations have a natural "lag time" [P13, EHO] and that "you've got to keep plugging away" [P11, dietitian] because collaborations "might not flow as quickly as you think" [P4, dietitian].

Not being open to collaboration was considered a barrier because it could result in not noticing opportunities even when they arise, and practitioners not being willing to work towards

a solution that worked for both sectors. Similarly, participants discussed acknowledging the fact that both health issues are connected as a facilitator, and conflicts had the potential to arise when practitioners did not work with the understanding that their actions could influence the health outcomes of the other sector. While these conflicts could be detrimental for collaborations, many participants from both sectors identified "points of tension" [P7, manager, health protection/environmental health] as factors that "initiated more of a collaborative work" [P5, dietitian], and were considered a barrier or facilitator to collaboration depending on whether practitioners viewed the conflict as a negative outcome or as an opportunity to improve the situation.

Participants described having "a common understanding of where you want to end up" [P9, manager, health protection/environmental health] as a concrete way to actively work with the recognition that the two sectors are connected, and to move forward with a collaboration despite potential conflict between the sectors. Participants also discussed fear of negative food safety outcomes from food security programs as both a barrier and facilitator to collaboration depending on which health outcome practitioners were working towards. Fear of negative food safety consequences often lead to not wanting to take any food safety risks, which could be a barrier through food safety practitioners implementing more rigorous enforcement of food safety regulations, or a facilitator when fear of negative food safety outcomes motivated food security practitioners to seek food safety practitioners' input within their programs. Ultimately, understanding that both sectors were working towards the same goal of improved population health, and recognizing that the benefits of achieving this goal outweighed any difficulties they experienced, facilitated successful collaboration between the two sectors.

Involving practitioners who "really understand their scope of practice" [P2, food security lead] was a facilitator to collaboration, and included practitioners of both sectors who have an in-depth understanding of their scope of practice. Involving practitioners with in-depth understandings of their scope of practice ensured that the requirements of each sector were met, but also allowed participants to be more innovative while still addressing their public health outcome. Participants also identified wanting to feel a level of trust that the information they bring, the outcome they are trying to achieve, and they themselves will be listened to and valued by the other practitioners. When this trust between practitioners was lacking, it acted as a barrier to collaboration.

Participants in this study similarly stressed the importance of communicating with practitioners in the other sector, particularly emphasizing that how practitioners communicate with each other is as important as what they are communicating. Providing explanations about the importance of specific health outcomes to practitioners in the other sector was a facilitator to collaboration, because it underpinned understanding and valuing the other sector, understanding the importance of a specific project, and influencing how others work. However, P11 (dietitian) argued that simply telling people what to do can still get the job done, as it requires practitioners to figure out a way to achieve the desired result, even though doing so could create tension between practitioners of the two sectors. Connecting with practitioners who had already

successfully collaborated with the other sector, or who had unsuccessfully attempted to do so, was also seen as a facilitator, because it allowed for sharing of examples and dialogue around what worked and what did not in different contexts. It also allowed practitioners to identify options to overcome problems, because "everybody's gone through growing pains with various things, and share the growing pains, or share the stumbling blocks before somebody else stumbles on it" [P6, food security project lead]. Connecting with those who had successfully collaborated also helped individuals figure out how others had done similar projects. When working on a particular collaboration, those in both sectors saw connecting with individuals in the other sector early, and on an ongoing basis, as a facilitator. As P14 (food safety expert) acknowledged, if practitioners were too far along a project before they contacted practitioners of the other sector, it might be too late to successfully collaborate because positions were already entrenched.

Participants identified the importance of understanding and valuing the other sector (e.g., their health impact, health outcomes, risks, perspectives, mandates, culture, challenges and resources) as a facilitator to collaboration. This mutual respect was important because the fact that there were two different sectors, with different public health outcomes they were trying to achieve, was often considered a barrier that was difficult to overcome. Additionally, not understanding the other sector was a barrier to collaboration, because it could prevent practitioners from recognizing the usefulness of collaboration, and it could result in exposing vulnerable populations to hazardous food. For example, P2 (food security lead) dismissed the risk associated with *E. coli* (which causes over 30,000 domestically-acquired foodborne illnesses in Canada each year, including over 440 hospitalized cases and over 12 deaths (Thomas et al., 2015) when discussing the role of food safety regulations in daycares: "You can't ban hamburger from pre-schools, right, (laughing) because they have a risk of *E. coli*... whatever."

Finally, taking a solutions-oriented approach, including "[creating] innovative, creative solutions" [P5, dietitian] and focusing on "the desired outcome" [P14, food safety expert] rather than on upholding usual processes to reach the outcome, was considered a facilitator to collaboration. Creating innovative solutions could be achieved by thinking creatively, looking beyond what has always been done, and problem-solving different ways to achieve an end goal or address an issue or barrier. Focusing on the outcome allowed innovative activities to occur as long as the food safety outcomes were met, rather than requiring specific processes that may not be applicable for new programs. However, P11 (dietitian) identified that the ability to implement creative solutions was dependent on context, as this ability was different in rural rather than urban settings due to urban settings often having more strict regulations that do not provide room for creativity compared to rural settings:

> I think the flexibility [to implement creative solutions] is transferrable, but the opportunity for flexibility may not be. Like I say, in the city, everyone has to hook up to the sewers, so, you can't have different kinds of toilets. Everyone has to hook up to the sewers. So, the creativity [to

> use different waste removal systems] can still be there, but there's no opportunity to act upon it. And so, that's where the challenge comes.

Ultimately, incorporating a solutions-oriented approach within a collaboration allowed practitioners to work towards improved public health outcomes, rather than upholding processes that may not meet population needs.

Discussion

In this study, we identified factors that facilitated, or were barriers to, successful collaboration between food safety and food security practitioners in BC, Canada. While participants discussed determinants at systemic, organizational, and interactional levels, there was a strong emphasis on the role of interactional determinants in supporting these collaborations. This emphasis on interactional determinants may stem from sampling practitioners working in front-line and management positions, and not incorporating individuals working at the organizational or systemic levels. However, this study highlighted actions that individual practitioners could take to support successful collaboration between the two sectors: seeking opportunities to interpret existing policies in a way that supports the outcomes of both sectors, and demonstrating these projects to their peers when they are completed successfully; and advocating for policies with a holistic view of the impact of food on population health. Overall, while the interactional determinants may have less of an impact on successful collaboration than determinants at the systemic or organizational levels, they provide actions that can be taken by individuals to enhance collaboration between the two sectors—even within contexts where factors like legislation and funding priorities may not clearly support collaboration—to synergize the programs of these sectors, and help minimize any unintended consequences on the health of the population.

This study is the first to explore barriers and facilitators to collaboration as perceived by public health practitioners working in food safety and food security. Previous research identified that "communicating", "understanding intent", "educating", "understanding risk and regulation", "recognizing scale", and "enhancing partnerships" are key to reducing tensions between practitioners of the two sectors (Martin & Perkin, 2016). Here, our results both compliment and extend these ideas to explicate further the barriers and facilitators that are experienced by individuals who have successfully collaborated with the other sector. Focusing on available assets as a solution to a health problem, rather than on the problem itself, is a strategy that has been used in public health (e.g., physical activity in disadvantaged women, according to Rütten, Abu-Omar, Frahsa & Morgan, 2009), particularly when existing barriers (e.g., limited resources) are difficult to change. Here, participants spoke to the actions that individuals and organizations can take to support more synergistic food safety and food security policies and programs within the current climate, as well as identified broader systemic barriers that could be targeted for

longer-term change. Therefore, looking at facilitators to collaborations between practitioners of the two sectors, rather than exclusively looking at the tensions between them, may better identify ways that practitioners can proceed with collaborations despite existing barriers.

Buckley (2015), in their exploration of successful adaptation of food safety regulations to small-scale operations, also identified similar factors to those identified by Martin and Perkin (2016) and to this study, specifically that relationships between the operators and inspectors, education, and "flexibility and mutual accommodation" influenced successful adaptation. In an extension of their findings, Buckley (2016) further identified "communication", "patience and empathy", "respect and consideration", and "experience and training" as important factors for successful collaboration between inspectors and operators of small-scale facilities. Buckley's work therefore provides an illustration of one of the ways that food safety and food security practitioners can collaborate to support improved population health.

While the results of this study aligned closely with the determinants of successful collaboration between different professional members of healthcare teams as outlined by San Martin-Rodriguez et al. (2005), there were four exceptions. They identified the social system as a source of power differentials between members of the healthcare team, stemming from the typical roles of physicians as decision-maker regarding patient healthcare and nurses as providing care to the patients based on these decisions (Baggs & Schmitt, 1997; Lockhart-Wood, 2000). This power differential stemming from hierarchical distributions of power within teams of healthcare professionals has been identified with other healthcare professionals (e.g., physicians and palliative network coordinators, Hermans et al., 2019; general practitioners and community pharmacists, Bollen, Harrison, Aslani & van Haastregt, 2019). However, this social system was supported in part by the laws outlining physician responsibility for patient-care (Hermans et al., 2019; Lockhart-Wood, 2000). Here, participants identified power differences as stemming from the legislative system, which was perceived as prioritizing food safety over food security. The existence of food safety legislation that mandates food safety activities to prevent foodborne disease, and the lack of an equivalent for food security, often resulted in more support for food safety practices than those of food security in situations where the goals of the two sectors were in conflict. To minimize the power differentials experienced between practitioners of the food safety and food security sectors, our participants highlighted that focusing on solutions (rather than on following process) was a key interactional determinant, in addition to the willingness to collaborate, trust, communication, and mutual respect that had been previously identified. This additional determinant allowed participants to overcome existing barriers, by working to achieve the intended outcomes of food safety legislation without focusing on outdated and prescriptive methods, and provided an opportunity for practitioners to work on practical solutions for new projects and in new settings while maintaining food.

Our participants also identified another new systemic determinant, the political system, in particular its short-term decision cycle, which often acted as an additional barrier. According to Hoffman, Creatore, Klassen, Lay, and Fafard (2019), short-term decision cycles are considered barriers because "[in] order to maintain and build electoral support, politicians need projects and

policies that are visible and have demonstrable effects within their time in office. Democratic politics can create political realities that favour short-term 'quick wins' over long-term sustained impact." (p. 271). This is problematic because the health impacts and cost-savings of public health efforts are often not seen until after the politicians in power have left their office, and thus may not be seen as a priority (Hoffman et al., 2019; Masters, et al., 2017). Additionally, successful public health efforts prevent future disease, which can be hard to attribute to any one intervention, further deprioritizing public health activities (Hoffman et al., 2019). The political system also served to create further tension between the food safety and food security sectors, as the impacts of actions undertaken to reduce foodborne illness were easier to demonstrate than the impacts of the actions undertaken to reduce food insecurity. Ultimately, political will is often not aligned with public health efforts, which was often considered another barrier that participants had to overcome or take into consideration when undertaking their public health actions.

This study is subject to several limitations. First, our participants may not be representative of all practitioners working in the food safety and food security sectors in BC. Here, all participants had successfully collaborated with practitioners of the other sector, so the facilitators and barriers identified here may not be the same as those felt by practitioners who have been unable to successfully collaborate. In particular, this study may underemphasize the extent to which barriers affect collaborations. In addition, our participants were all mid- to late career, meaning this study may not accurately depict the factors experienced by early career practitioners. Buckley (2015) identified that younger inspectors were less collaborative than more experienced inspectors, so early career practitioners may experience the facilitators and barriers identified here differently, or may experience different facilitators or barriers altogether. To support collaboration between early career practitioners, the food safety curriculum should incorporate food security, healthy eating, and interprofessional collaboration training. Ultimately, better understanding the breadth, and relative significance, of factors that influence the success of collaborations between public health practitioners working in the food safety and food security sectors is needed. Finally, as recognized by our participants, food safety and food security deal with issues, and are driven by factors, that are dynamic. Thus, these results may be most applicable to the current context. However, many of the facilitators identified by participants, particularly at the individual and organizational levels, are factors that require ongoing engagement to sustain, such that they should be able to adapt to changing food safety and food security landscapes.

Despite these limitations, this study addressed a gap in the literature by providing the first in-depth exploration of factors that influenced the success of collaborations between practitioners of the food safety and food security sectors. Importantly, because we explored the perspectives of those who successfully collaborated with the other sector, our findings highlight ways individuals can overcome existing barriers to intersectoral collaboration within the current context, to more successfully improve the health of the population. In addition, these findings may be applicable beyond the food safety and food security sectors, to collaborations with other public health – or even non-health – sectors where collaboration is important, and where there

are competing priorities, differing approaches, real or perceived power differentials between practitioners of different sectors, or where legislation has the potential to impact hard to measure activities.

Conclusions

This study identified that a range of systemic, organizational, and interactional determinants influenced successful collaboration between food safety and food security practitioners in BC, Canada, with systemic determinants most likely to be barriers, and interactional determinants most likely to be facilitators. More research is needed to (1) explore the full range of facilitators and barriers felt by public health practitioners of these two sectors, (2) incorporate a broader range of perspectives (e.g., early career practitioners), and (3) identify what regional health organizations, provincial health organizations, and the public health realm in general can do to promote and support more collaboration between practitioners of the two sectors, in order to better support improved population health.

Conflicts of Interest: The authors declare that they have no conflicts of interest.

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Original Research Article

What makes a CSA a CSA: A framework for comparing community supported agriculture, with cases from Canada and China

Zhenzhong Si[a*], Theresa Schumilas[a], Weiping Chen[b], Anthony M. Fuller[c], Steffanie Scott[a]

[a] University of Waterloo
[b] Renmin University of China
[c] University of Guelph

Abstract

In different parts of the world, community supported agriculture (CSA) has taken a variety of organizational forms, drawn on different ideologies, used a variety of land tenure arrangements, and taken on varied types of market relations in terms of how they arrange sales and memberships. Despite this, comparative studies of CSAs are sparse. Based on interviews and survey results, this paper develops a framework to compare CSAs in Canada—where this system has evolved for the last 30 years as an alternative to industrialized agriculture—with those in China, where CSAs have emerged since the late 2000s, mainly in response to food safety and health concerns. The comparison is based on their initiators' motivations, economic characteristics, ecological practices, shareholder relations, and community building. We find that in both Canada and China CSAs are struggling to maintain the movement's original values and be economically viable. They are moving away from the traditional 'risk sharing' approach underpinning the model and adopting more flexible payment mechanisms. However, other original tenets of the CSA model, such as member engagement, are strengthening. This poses a definitional challenge—what makes a CSA a CSA? We conclude that CSAs mix capitalist and other-than-capitalist economic logic, blend traditional, organic, and productivist ecological relations, and demonstrate both individualist and civic collectivist politics simultaneously. These characterizations are what make a CSA a CSA in contemporary Canada and China.

Keywords: Community supported agriculture (CSA); Canada; China; alternative food networks

*Corresponding author: sizhenzhong@gmail.com
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Introduction

Critical food scholars have argued that the global agro-industrial system, which disconnects people from food production and associated ecologies, results in an increasing number of environmental, social, and economic vulnerabilities and problems (Gomiero et al., 2011; IPES-Food, 2017a; IPES-Food, 2017b; Weis, 2010). As a result, several concerns and related responses to the industrialization of food systems are arising simultaneously in many different parts of the world. Community Supported Agriculture (CSA) initiatives are a major type of these alternatives (Cone & Myhre, 2000).

CSAs are a frequently studied producer-consumer venture type in practice and scholarship (Brown & Miller, 2008; Cox et al., 2008; DeLind, 2003; Feagan & Henderson, 2009; Galt, 2013). In the classic CSA approach in Europe and North America (Brown & Miller, 2008), a group of consumers (usually referred to as "members" or "shareholders") support a farmer by purchasing a share of the farm's production at the beginning of the season, thus sharing the risks and benefits of the harvest. In this way, CSAs following this classic model redistribute value back to farmers by reducing the intermediaries along the food value chain, re-building trust and sharing risks between farmers and consumers, and producing food with an "ethics of care" (Cox et al., 2008) that shows consideration for both people and ecosystems.

The practices of CSAs have evolved significantly in the past 30 years (Galt et al., 2012). Today, they take a variety of organizational forms, draw on different ideologies, use a variety of land tenure arrangements and have various types of market relations (Schumilas, 2014). These new developments and variations continuously enrich the meanings of CSAs. Yet, they also render elusive the definition of a CSA. A key question thus emerges: What key characteristics differentiate a CSA from other alternatives? In other words, what makes a CSA a CSA?

To address this gap, this paper compares CSAs in Canada—where they have evolved for the last 30 years as an alternative to industrialized agriculture—with CSAs in China, which have emerged since the late 2000s. We describe several dimensions of CSAs that emerged in interviews and surveys in both countries. These dimensions form a framework for comparing the similarities and differences of CSAs in diverse contexts. We suggest that in both Canada and China CSAs sit at a highly paradoxical moment where consumers are seeking higher quality food and reconnection with food production amid growing social inequities, inability of small-scale farmers to earn a living, and deepening consumer capitalism. Consumer capitalism puts consumer interests at the centre of companies' product market strategies (Trumbull, 2006). In this context, the boundary imagined to divide alternative markets from mainstream markets is becoming blurred. Consumers seeking individualist responses, such as customization of shares, drive the adaptations of CSAs, yet at the same time CSA operators are engaged in non-market relations such as (re)connecting producers and eaters and establishing "collective subjectivities" around food (Levkoe, 2011, p. 691). We observe that CSAs in both countries manifest these contradictory characteristics, raising questions about the definition of "CSA". We argue that CSA as an umbrella term has much richer connotations than its original conceptualization might

suggest. This is particularly true given that in recent years, CSAs are appearing in emerging economies such as China, where they are shaped by local political economic contexts.

The paper does not intend to be judgmental (i.e., to determine whether a specific set of practices should or should not be called a CSA). The purpose of our central question is rather to look at the key features of contemporary CSAs and how CSAs in Canada differ from those in China and from their original conception. The paper aims to revisit the CSA concept and comment on the diversity of CSA practices because of the many innovations and changes in the economic, social, and ecological dimensions of CSAs. Another key focus is to question how useful the term is from a research perspective in the global context, given that most existing studies of CSAs were conducted in the Global North.

We begin by describing the research studies and data supporting our analysis and the definition of CSA that guided our research. We then introduce the framework for comparing CSAs that evolved from our research. Using this framework, we compare CSAs in China and Canada and then finally return to the definition of CSA.

Methods and data sources

Much of the CSA scholarship is based on studies of individual CSA operations or case studies of particular places. In contrast, we present an analysis that draws together surveys of CSA operations in both China and Canada. Since 2010 several of the authors have conducted a multi-site research study on the ecological sector in China, funded by the Social Sciences and Humanities Research Council of Canada. We conducted interviews in Beijing, Chongqing, and Shanghai, as well as in the provinces of Liaoning, Henan, Shandong, Jiangsu, Anhui, Zhejiang, Fujian, Hainan, Sichuan, and Guangxi. We spoke with employees and owners of organic and "green food" farms, representatives of organic certification bodies, government agencies, consumer associations, NGOs and community organizers, and researchers. Many of these stakeholders were engaged in the operation, promotion, or governance of CSAs in China, given that most CSAs in China were considered ecological farms. The data employed in this paper were part of this broad research project. Part of this larger project also included in-depth interviews, farm visits, and a written survey of a subset of 15 Chinese CSAs conducted by the second author. This information is supplemented by 70 additional CSA surveys conducted by one of the authors in China in 2014.

The Canadian CSA data are drawn from a 2011 survey of CSAs in Ontario undertaken by the second author in partnership with the Organic Council of Ontario (a provincial non-governmental organization), with funding from the Ontario Ministry of Agriculture and Food. According to the 2016 Census of Agriculture, Ontario comprises 38% of the Canada's population and 26% of the country's farms. Farmland in Southern Ontario covers a significant portion of Canada's prime agricultural lands (Walton. 2003). Based on the national survey of CSAs conducted by Devlin and Davies (2016), more than one-third of Canadian CSAs operate in

Ontario. We first compiled a list of 200 CSAs in Ontario using a broad internet search. Then we contacted all of them and received 91 responses. The information reported in this paper is based on interviews with these 91 CSAs. These interview data are supplemented with more recent survey data from 100 Canadian CSAs (Devlin & Davis, 2016).

These research projects were executed independently and employed different research tools. We have extracted the variables and information that these projects have in common but acknowledge the limitation of this approach. That the wording of these surveys varied, and that they were translated into different languages, might have affected the consistency in data collection, although the interpretation of these questions was checked carefully to ensure comparability. In addition, these surveys are not based on a random sampling approach and thus are not necessarily representative of the overall situation of CSAs in either country. However, the research combines national surveys and specific case studies in both countries. With extensive interview data conducted in China and Canada, the data from the national surveys from our research team in China, the surveys conducted in Canada by researchers from the University of Guelph (Devlin & Davies, 2016), and secondary information that cross verify the results, we believe the paper captures the characteristics of the majority of CSAs.

Definition of 'CSA' and a framework for interrogation

It is challenging to obtain an accurate number of CSAs in either Canada or China because there is no organization maintaining a census, and because there is no agreed upon definition of what to count. This definitional problem is acute in China, where the initialism CSA is frequently used to label a diversity of ventures. In China the CSA approach was imported from the Global North, with later influences from the Teikei movement in Japan, rather than appearing as an endogenous development (Schumilas, 2014; Si et al., 2015). The English initialism CSA is typically used in discussions and promotion of the model within China because the translation is not straightforward. The Chinese word for *community* (*shequ*) commonly refers to a gated community or a housing complex. So, the use of the word to denote a community of affiliation does not translate easily into Chinese and requires much additional explanation. Recently, the term CSA was translated as *shehui shengtai nongye* ("social ecological agriculture") to highlight the socially and ecologically embedded nature of these farms (Zhang, 2018). Meanwhile, the English initialism CSA was also widely adopted. Direct-to-consumer farms as well as online ordering stores, for example, refer to themselves using "CSA." This might describe a small-scale farmer who enrolls members in a way quite similar to the Global North understanding (see Chen, 2015). However, it can also describe a much larger business that aggregates products, which may or may not be ecologically produced, from multiple farms and makes these products available through quite sophisticated online storefront operations (see Galt et al., 2012). In Canada we

usually refer to these as "food box" programs and do not typically use the term CSA to describe them.

Given this confusing landscape, we developed an operational definition for our research:

> A CSA is an initiative in which an operator (either a rural or urban resident) sells products from land that they have a direct hand in managing,[1] using ecological methods, to an established group of repeat buyers with whom they are directly connected.

Note that in our research we excluded cases in which consumers ordered from an online store from a list of options without direct connection to a CSA operator and with no possibility of visiting a farm. However, we did include operations with diverse payment options. While some degree of direct connection with the farm and CSA operator was essential to our definition of CSA, we did not include a requirement that the consumer (member) shares the production risk (i.e., crop failures) with the farmer. We unpack this further below.

Our findings show that CSAs are an extremely diverse food distribution approach, and it is difficult to describe a typical CSA in either country. Drawing from this diversity and also considering the definition we have proposed, we evolved a framework to help us draw our different research projects into conversation. Table 1 outlines the dimensions and questions that we have used to compare CSAs in Canada and China. The framework is derived from the report of Canadian CSAs by Devlin and Davis (2016). The economic dimension of the framework also integrates the work of Gibson-Graham (2008) that interrogates the emergence of "diverse economies." The framework touches upon various economic, social, and ecological dimensions, and thus allows a comprehensive examination of CSA operations.

Table 1: Dimensions for examining CSAs

Dimensions	Sub-Dimensions	Key Questions
Demographics and Motivations		Who started the CSA and why?
Economic Dimension[2]	1. Enterprise Type	What is the ownership/legal structure? How are revenues and profits made and/or re-distributed (e.g. sole-proprietorship, co-operative, not-for-profit, corporate)?
	2. Scale and Transactions	What are the scale and logistics of the CSA? Are these monetary transactions or other? To what extent does the CSA support the farmer's livelihood?
	3. Labour Relations	Is labour waged, alternatively waged (barter), or non-waged (volunteers)? What are the

[1] The word "managing" here has a broad connotation because the roles of the operator(s) of a CSA farm can be very diverse. This may include activities not only related directly to farming but also other activities such as packaging, marketing, and customer service. It can also include activities such as educational, research, and food advocacy projects happening on the farm. It is this diversity that makes CSAs very dynamic and thus merit further interrogations.

[2]

		relationships with labour regarding training and mentorship?
	4. Land Tenure	Is land private, rented, and/or held in a form of commons ownership?
	5. Risk Sharing	How were the CSAs financed initially? (i.e., equity financing? investment? self-financed?) How is risk being shared in the CSA?
Ecological Dimension	1. Functional Integrity	To what degree do the production practices reflect a mutual interdependence of human and ecological systems? (e.g., genetic diversity, closed loop systems, protection of soil structure and biology)
	2. Certification	Are the ecological practices verified by a third party?
Producer-Consumer (Re)-Connections		In what ways are producers and consumers connecting and reconnecting? How are CSAs communicating with and engaging members? How are CSA members drawn beyond their role as consumers into collaborative relationships with operators?
Community Organizing		In what ways are CSAs moving beyond instrumental market relations to bring about larger-scale structural changes? What is the relationship with the state?

Table 2: Comparison of CSAs in Canada and China

		Canada (Ontario only)	**Canada** (Devlin and Davis 2016)	**China**	**China**
		N=91	N=100	N=70	N=15
Operator Demographics & Motivations					
Age	Less than 40 years		58%	67%	
	Less than 30 years		16%	21%	
Education	University/College Graduate	82%	87%	53%	
	Graduate Degree	12%		14%	
Farming Background	Grew up on a farm	20%	37%		13%
Economic Dimension					
Enterprise Type	Sole Proprietorship (Household Farming)	85%	90%		94%
	Partnership or Cooperative	15%	10%		6%
Scale and Transactions	Average acres (range)	5.0 (.05 – 30)	3.2 (.05 – 25)		6.0 (1 – 13)
	Average members (range)	108 (3 – 335)	100 (2 – 657)		180 (3 – 400)
	Operators that rely on off-farm income		45%	29%	
	Use of additional marketing channels	90%	86%	70%	75%
Labour Relations	Average paid labourers per farm		6.6		14

	Use of volunteers and workshares	31%	19%	47%	
Land Tenure	Ownership of land (primarily)	78%	73%		
	Operating exclusively on leased land	21%	28%	84%	
Ecological Dimension					
	Incorporating compost/manure		97%		100%
	Crop rotation/cover crops		91%		38%
	No GMO in feed and seed		89%		100%
	Organic certification (third-party verification)	28%	34%	10%	6%
Producer-Consumer Reconnections					
	Use social media to reconnect		93%	67%	100%
	On farm visits and events		72%	39%	75%
	Plots available for use				47%

Different contexts for CSA emergence

CSAs in Canada emerged in the 1980s within a rich civil society discourse focused on community development. This movement embraced ideas of empowerment that included *collective participation* (individuals are part of the decision making process), *self-determination* (individuals are free and able to choose their own course of action), and *distributive justice* (challenges and benefits are fairly shared) (Lord & Hutchison, 1993; Rappaport, 1987; Wallerstein, 1992). Further, the early CSAs in North America were inspired by the writings of Rudolf Steiner and the idea of the biodynamic farm as a circular system (Steiner, 1924 as cited in Paul, 2011). Following Steiner, CSA farmers began to understand their farms as whole organisms and sustainability as extending beyond the ecological to include the social and economic life of communities. CSAs became a holistic way of living—not simply a way of farming—with the consumer integrated into the work of the farm and supporting the farmer in ways that were not only monetary (McFadden, 2004). The early CSA movement in Canada can thus be considered idealistic, even utopian. The approach was built on alternative, community-based ecological, economic, and social values, and framed as a response to the mainstream food system after the severe financial crisis in farming that occurred in the early 1980s.

Our research found that the context framing the emergence of CSAs in present day China is significantly different. It is one of rapid social, economic, and cultural change occurring in a political economy characterized by a strong state and weak civil society. China's unique version of "capitalism with social characteristics" embraces a commons approach to land ownership, predominance of smallholder agriculture, a state commitment to domestic grain security, nascent

food safety legislation, and a civil society with limited autonomy from an authoritarian state that keeps shifting the terrain of what is permitted (Scott et al., 2018). In this context, China's agri-food system has been industrializing and modernizing rapidly since the adoption of machinery in the 1950s, the extensive use of commercial fertilizer (along with hybrid rice) since the mid-1980s, and the commercialization of seeds in the early 2000s (Reardon et al., 2003; Si, 2019). At the same time, the social and political environment is characterized by newly emergent urban middle class, growing social inequality and state concern with continued economic expansion, rural poverty reduction, and the maintenance of a harmonious society (Anagnost, 2008; Si et al., 2015). Further, unlike the Canadian context for CSA emergence, the movement in China responds to increased demand for high-quality food with good taste and health attributes, and especially food safety (Gale & Huang, 2007; Shi et al., 2011; Si et al., 2015; Scott et al., 2018). This is driven by the pervasive food safety crisis that the state has been struggling to address. Although food safety is also a top motivation for people to join CSAs in many other countries, the concern particularly predominates among Chinese CSA customers due to the food safety crisis of the past decade or so. This predominant focus on the safety and other health features of food by Chinese CSAs and their members overshadows their social and environmental values (Si et al., 2015). This reduces the resilience of these CSAs and may put their business at risk if the food safety concern is eased or other modern food retail formats emerge and are able to provide safe, trustworthy food at a lower price.

In conclusion, we observe that whereas CSAs in Canada evolved within a philosophy of empowerment, a farm debt crisis, and a growing movement promoting ecological agriculture, in China they are arising largely as an entrepreneurial and market response to change and uncertainties, particularly pervasive food safety risks, in a context with limited organized civil society (Schumilas & Scott, 2016). Reviewing their origins is critical for this comparative study because the differences of their origins explain the many distinctive features demonstrated by Chinese CSAs in comparison to those in Canada. Due to the absence of a food movement in China, CSAs are less shaped by environmental and social values. The lack of historic connections makes the configuration of CSAs revolve more heavily around contemporary, immediate, and obvious concerns—in the Chinese case, food safety—while deeper concerns such as the problematization of the mainstream industrial food system are overlooked.

Demographics and motivations – who are the CSA farmers?

CSA farms in China are primarily operated by highly educated individuals with diverse motivations. They are primarily urban born with limited direct experience in farming or agriculture. Our survey shows that most farmers (67%) are less than 40 years old and 21% are younger than 30. These CSA operators are more highly educated than other farm operators in China. About 53% of them have attended universities and 14% have graduate school education.

These CSA initiators refer to themselves as "new farmers," explaining that, in contrast to traditional peasant farmers, they produce food in ecological ways and have rich knowledge of digital communication technologies and market demands.

In Canada, as in China, CSA farmers are younger and more highly educated than the general farming population. Indeed, 82% to 87%[3] of Canadian CSA operators have undergraduate or technical degrees and 12% have graduate degrees. Unlike in China, Canada's CSA initiators are primarily from rural areas. However, averages mask an important demographic change here. Our observation found that since Canada's CSA movement started in the 1980s, there exists a group of older, experienced, pioneer CSA farmers. If we were to remove this first cohort of farmers, we may see similar demographics to those in China. In both countries today, CSAs are being started by urban people with little or no farming or CSA experience.

Motivations for starting CSAs in both countries are remarkably similar. In China for example, the most common motivation of farmers we surveyed is "pursuing a new way of life" (76%), with reference to pragmatic and instrumental motives, and in Canada CSA initiators also see the CSA as an entrepreneurial opportunity. In addition, in both countries CSA initiators told us they started CSAs to protect the environment and reconnect urban consumers with food production and farming. In both countries, CSA initiators are motivated to produce higher quality food, although the meaning of "quality" differs between these contexts. In Canada, most CSA farmers told us that food quality referred to food produced locally, using ecological methods, where procurement directly from the grower was valued. In contrast, CSA operators in China understood food quality to be safe and healthful food, that was always perceived to have better taste[4]. China's CSA operators told us that food safety and quality is a "crisis" in China and this is thus a primary way to engage with and broaden the awareness of others, in order to respond to what they see as the state's inability to ensure a safe and healthy food supply. The scalar association with quality (i.e., linking quality to the food being sourced locally) that we heard from CSA farmers in Canada was almost totally absent in our interviews with China's CSA operators.

A further difference is that CSA initiators in China spoke about the loss of traditions accompanying the modernization of the food system; they seemed strongly motivated by traditional Chinese pastoral and idyllic imaginaries. We also found that many operators of leading Chinese CSAs were inspired and motivated by the New Rural Reconstruction Movement, a civil society initiative that promotes revitalization of traditional Chinese culture, ecological agriculture, and sustainable rural development (Si & Scott, 2016; Scott et al., 2018). Building on their strong connections with universities and non-governmental organizations, the New Rural Reconstruction Movement has assisted in the success of a few well-known CSA

[3] These two percentages come from different data sources. The figure is 82% according to our survey in Ontario and 87% according to Devlin and Davis (2016). See Table 2.

[4] We found in our fieldwork that there is consensus between CSA operators and their customers that the taste of food from CSA farms is much better than food from conventional channels. It is one major reason that people join CSAs, other than the safety of food.

farms. Members of this movement see the development of CSAs as a promising approach to achieving their rural development goals. Through organizing CSA symposiums and training workshops, the New Rural Reconstruction Movement has motivated young people to establish ecological farms in the countryside, many of which are CSAs.

Economic dimension

Enterprise type

While a diversity of CSA organizational and ownership structures can be found in both Canada and China, household-operated CSAs, or what is generally referred to as *sole proprietorship* in Canada, is the most common approach. It is interesting to note that this sole ownership form is associated with the greatest liability and vulnerability for the producer, since they are solely responsible for the farm. In Canada this may be changing. Our research suggests that multi-farm CSAs are becoming increasingly popular as a way to reduce this vulnerability. In this arrangement, individual farmers collaborate to form a network or partnership arrangement. These networks are often dynamic and informal, with each new season bringing about a change in the structure and function of the collaboration. Farmers might come together to plan for the season collaboratively, or there may be one farmer who adopts a brokerage role and arranges to purchase products from farms in the network. In these collaborations, farmers can more easily ensure the diversity and stability of their food shares. Individual farmers can specialize in growing products best suited to their situation (based on expertise, available equipment and labour, soil type and topography, etc.) Plus, the burdens and risks are shared across growers, making it a particularly appealing model for beginning CSA operators, especially in situations where consumers are reluctant to share risks with the grower. Typically, farmers do not formalize their structure into legal cooperatives. In Canada, farmers told us that this kind of less formalized multi-farm CSA structure allows them to experience all the benefits of a legally incorporated cooperative, but without the administration and commitments that cooperatives require. The situation is a bit different in China, as multi-farm CSAs mainly refer to CSAs that have multiple production sites across the country, rather than a collaborative initiative among a few independent CSAs. This enables the CSA to have a stable supply of a variety of produce throughout the year. This feature of their organizational structure reinforces our observation that CSA farmers seek flexibility and autonomy in the arrangements they choose.

In both China and Canada, a small number of CSAs are being operated by or under the aegis of not-for-profit organizations[5] (see Si, 2017). In this structure, an organization offers a variety of supports and benefits to the CSA including access to funding, marketing, reputational

[5] It is difficult for not-for-profit organizations to register in China due to legislative and regulatory constraints. Such CSAs therefore are normally registered as businesses despite their not-for-profit orientation.

benefits, and assistance with building connections and networks. In both countries, these not-for-profit–supported CSAs, while small in number, take leadership roles in the movement and offer advice, workshops, training and/or marketing support to other CSA farms, and can be credited with generally advocating for and expanding the CSA approach. Indeed, these farms function as dissemination nodes and can be seen as a response to the evident need for education, training, and advice in the CSA movement. Despite these demands, we also find that, compared to Canada, formal networks for education, training, and solidarity building for the CSA movement in China are weaker due to state restrictions on civil society organizing, generalized lack of trust in civil society organizations, and farmers' reluctance to pay membership fees.

Scale and transactions

While there are a few large CSAs in both China and Canada, generally, in both countries, CSAs are small-sized farms producing on less than five acres, with fewer than 100 members or shares. While small in size, their cumulative impact can be significant. For example, in 2011 the CSA market in Ontario was estimated at $7.3 million, offering shares to 8,000 families (i.e., some 25,000 or more people) (Organic Council of Ontario, 2012). Most operators in both countries supplement their CSA sales by selling produce through additional channels such as farmers markets, restaurants, produce distributors, online buying clubs, and specialty stores. With the rise of online shopping, most CSAs in both countries are now selling online to some extent. However, despite heroic marketing efforts in both China and Canada, we found that CSA sales are insufficient to support farmer livelihoods. This resembles the strong self-exploitation of CSA farmers identified by Ekers, Levkoe, Walker and Dale (2016) in Ontario. Forty-five percent of operators in Canada and 29% of operators in China rely on off-farm work.

Risk sharing

The first North American CSAs rejected the emphasis on industrialization, economies of scale, and maximization of efficiency, which have become the imperatives that define conventional agriculture. In the original CSA pricing approach, the eater pre-purchases a share or box of goods at the beginning of the season and the producer chooses the share's contents weekly, depending on the harvest. In this way, members who buy shares are in essence speculating on their produce and sharing the production risk with the grower.

Most Canadian CSAs continue to follow this pre-purchase, risk-sharing approach. In contrast, in China, although the pre-purchase model was adopted by early CSAs, it is now very unusual for CSA members to pre-purchase season shares. As a response to consumer needs of flexibility, these CSAs have established more pragmatic member payment schemes such as prepay credit for later purchases through online ordering systems or paying week by week. Some

Chinese CSAs sell fully customized boxes of vegetables by the week, with no requirement for pre-purchase and thus no risk-sharing with the farmer. Indeed, we have questioned whether the label of CSA is appropriate in many of these situations.

While most Canadian CSAs are still following the traditional risk-sharing model, operators are finding it increasingly difficult to find consumers prepared to buy in to this model. Many Ontario CSA farmers we spoke with are considering more flexible arrangements. For example, point systems are growing in popularity, in which the eater purchases a share in advance at a fixed price, and then selects produce based on the established points, thus giving eaters more choice. Further, a number of Ontario CSAs we spoke with guarantee a fixed quantity of produce and buy items from other farms if their own harvest is lacking, effectively re-internalizing production risks. Indeed, in both countries, CSA operators struggle to stay attractive and competitive in the local food marketplace where consumerist values prevail. These findings support those of earlier CSA research (Feagan & Henderson, 2009), showing that CSAs are eschewing some of their founding principles such as risk-sharing, and becoming more oriented toward consumer demands for greater choice.

Labour

CSAs in Canada and China approach farm labour needs differently. In Canada, while a few larger CSAs employ multiple labourers, most CSA operators carry out most of the labour on their farm themselves. This resembles other studies in Canada and the US that demonstrate that the survival of many CSA farms facing their industrial counterparts relies upon processes of self-exploitation (Ekers et al., 2016; Galt, 2013). A minority of farmers we spoke with pay for labour, and if they do, it is typically only one or two workers on a part-time basis. Alternatively, waged approaches (Gibson-Graham, 2008) were common, with 30% of farms offering formal internship/training programs on their farms and 31% offering "work shares". Non-waged labours in the form of interns, apprentices, and volunteers are found to be essential for the persistence of the moral economy despite the fact that many of them are marginally or not profitable (Ekers et al., 2016). In Canada, a work share refers to a member who contributes to the overall production of the farm as part of the farm's labour pool and receives an allocated share of food in exchange. In contrast, most Chinese CSAs employ large numbers of peasant workers. On average, we observed two workers employed per acre, in addition to non-waged family members. Despite this, finding enough labour is one of the major challenges facing Chinese CSA operators. This is particularly true as most CSAs are located close to major cities such as Beijing, Shanghai, and Chengdu, where non-farming job opportunities in the city are more appealing to younger people. As a result, most hired labourers on Chinese CSAs are seniors from nearby villages. In addition, we also observed a clear separation of management and labour functions with little worker participation in farm decision-making and governance. Chinese CSAs report work shares (*laodong fen'e* in Chinese) as a form of labour, but the way this term has been adopted is

revealing. In China, this term reflects a more individualist approach, where consumers rent land on the farm, and participate in or oversee the production of vegetables for themselves (Chen, 2013) in a type of farmer-mentored garden plot.

The alternatively waged labour arrangements in the Global North (workshares, volunteers, internships) are often a way in which people interested in starting CSAs learn about the approach and develop the skills necessary to start their own CSA once they acquire land. So, while these are labourers, they are also closer to being "co-farmers" and are, at least to some extent, involved in farm decisions (Cameron, 2010; Cameron & Gordon, 2010). In China, CSAs also recruit volunteers and interns who are interested in starting their own CSAs to help on the farm. However, in our observations, these are typically urban residents, not peasant farmers. In China, the CSA operators shape the conditions of employment of the peasant workers, frequently telling us that waged peasants were ignorant of ecological farming techniques. The marginalization of peasant farmers in CSAs is indeed not a widely discussed issue among Chinese CSAs, but analyses of public and political discourse detail the ways in which peasants and peasant production are cast as ignorant, backward, and responsible for holding back progress (Schneider, 2015). Indeed, in our research, even the central protagonists of the CSA movement in China, who by all other accounts took strongly egalitarian positions, at times seemed blind to peasant marginalization and injustice. That said, we also learned that in 2012, a small group of Chinese food activists started a new approach to experiment with value redistribution through a model of working *with* peasants, rather than hiring and "sharing more harvest" with them. This experiment has gained limited success (Si, 2017).

Land tenure

While CSAs in both Canada and China adopt similar organizational structures, and have been initiated in similar ways, the means by which land is accessed are quite different. In the 1980s, China replaced its commune-based production system with the Household Responsibility System in which households became the primary production units. The adoption of a "contracted responsibility" system in rural areas equitably redistributed land to peasant households based on the number of family members. As such, the land tenure system in China is based on land leased from these peasant households, usually brokered through local village committees and new elites (Xu & Fuller, 2018). The majority of CSAs in China therefore rely entirely on land leased from villages and peasant households. In only a few instances did we find that peasant households started CSAs on their own contracted land under the Household Responsibility System.

Although this commons approach, at first blush, seems ideal because it makes farmland accessible for running CSAs, there are also significant disadvantages to leasing. In peri-urban areas that are vulnerable to urban expansion, some leases can be quite short, making it difficult for the long-term planning needed for the sound development of ecological agriculture. We also

learned that, in many other cases, the rent is typically increased every one or two years, adding to the cost and challenging the economic viability of these farms.

In Canada, compared to China, more diverse approaches to gaining access to land for CSAs are evident. Most CSAs we interviewed (78%) operate on land owned by the farmer or the farmer's family. In many cases, this land had been held by the family for decades. However, purchasing a farm is beyond the reach of newcomers to the CSA movement and farmers need to become quite creative about land tenure. Approximately 21% of farmers we interviewed had found sympathetic farmers from whom they could lease small portions of land. Other arrangements we uncovered included obtaining permission to grow food on municipally owned land, or land owned by churches in urban areas, or simply "squatting" on public right-of-way land without any formal use agreement. Wittman et al. (2017) identified new forms of cooperative land tenure emerging among local food initiatives in Canada. We also found that accessible land is often located the furthest from urban centres, making the operation of direct-to-consumer marketing more challenging and resulting in higher food miles.

Ecological relations

In both Canada and China, most agronomic practices of the CSAs we surveyed and visited were largely consistent with IFOAM (2009) organic principles, including sourcing non-GMO seed, using on-farm composting and manure, mulching, mixed cropping, and avoidance of synthetic pesticides and fertilizers. Chinese farms were strongly embracing closed loop farming systems, referred to as "circular farming," in contrast to industrial systems that rely on off-farm inputs. Almost all the Chinese CSAs we visited practiced circular farming through techniques such as anaerobic fermentation of vegetable wastes, using composted human manure for fertility, integrating livestock into farming systems, and relying on plant-based medicines for veterinary health. In contrast, the use of cover crops and intercropping, two practices considered strongly ecological and essential to organic systems, were less common in China. The absence of these specific practices stands in contrast to traditional Chinese practices. Intercropping is a traditional practice in China in which two or more crops are grown on the same field in order to more efficiently use land, water, and nutrients, as well as to lower weed and pest pressure. China has a strong history of diverse sustainable farming practices including well-known examples of traditional rice-fish-duck cultivation systems in Central and South China (Fuller & Min, 2013; Shi et al., 2011). Despite this, CSA operators we interviewed felt these ecological practices were very labour intensive and told us they lacked the necessary equipment and traditional knowledge to implement such practices on their farms.

There are some possible explanations as to why certain ecological practices are adopted and others are not. First, these are nascent ecological farms in China, with inexperienced operators. Some practices may be beyond the beginning skill levels of these farmers; we might anticipate the growth of such practices as the sector matures. Second, in China, the state

influences the adoption of particular practices through subsidies for certain technologies. We noted that advanced greenhouse systems are evident on these farms because of state support for such infrastructure. Similarly, the Chinese CSAs were using various biofertilizers and ecological insect management approaches that the state supports, but the state is not offering support for cover cropping and many other soil building practices. Third, whereas a group of pioneer CSA farmers and internship programs are available in Canada to mentor new entrants, such skill building and training programs are not yet commonplace in China. Given the lack of civil society-based networking and skill building opportunities, most CSA operators in China are learning by trial and error. That said, there is indeed a variety of information available through books and on the internet in Chinese. Despite that, it is always a challenge to find sources of information adapted to local conditions. Hence, most operators in China are still conducting all kinds of experiments in farming, with references to different farming styles from abroad, such as organic agriculture, natural farming, biodynamic agriculture, and so on.

Third-party verification

CSA farmers in Canada are more likely than their Chinese counterparts to seek third-party verification of their practices. Canada's organic regulation only requires certification when a farmer is selling organic goods across a provincial border, so there is no requirement to have a third party verify production for CSA sales. Yet, in Ontario, 27% of CSAs pursue certification voluntarily. In our interviews, farmers explained this decision by expressing their endorsement of Canada's organic standard, demonstrating their support for ecological principles and their desire to show solidarity with their peers and contribute to a unified voice for organic growers across the country. In comparison, few CSAs in China pursued third-party certification. While most CSA operators told us they followed organic principles in their operation, only 6% to 10% pursued organic certification. Several interviewees explained to us that there is widespread mistrust of the process of certification among consumers and they rely instead on "participatory certification," by which they mean consumers visiting farms to observe the practices for themselves. The Participatory Guarantee System, in which a group of farmers, ecological farming organizations, consumers, and academics organize themselves to inspect farms, is also practiced among a growing number of CSAs.

In both countries, however, farmers felt that certification systems were not designed for them. Farmers believe that such verification systems are designed for larger farms selling into long and distant value chains and are unaffordable for smaller operators. This is particularly the case in China, where we calculated the cost of organic verification to be ten times more per acre than in Canada. Interviewees in both countries spoke critically about the lack of state support for ecological agriculture. In addition, Chinese CSA operators and consumers alike are cynical and suspicious about the state's role in organic standard setting (Schumilas & Scott, 2016).

Produce-Consumer (re)connections

Despite modifications to share structures and risk sharing in response to consumer demands that were outlined above, we found that in both Canada and China, CSA operators are working hard to challenge the conventional distinction between buyer and seller by encouraging member involvement and reconnection. All the CSAs we interviewed in both countries spoke about the many ways they interact with their members to foster a supportive community. Our research supports previous CSA research (Feagan & Henderson, 2009) in concluding that reconnections and member engagement seem to be a key definitional element of CSAs. Almost all encourage members to visit the farm, most use newsletters and hold social events, and most see themselves in an educational role. We were struck by the advanced use of social media platforms by Chinese CSA operators for marketing, member engagement, e-commerce, and arranging deliveries. Most Chinese CSAs surveyed members for feedback regularly. However, CSAs in Ontario appear more likely to go further and involve members on advisory committees to help with difficult decisions such as pricing structures or how to handle a crop failure. That said, we also learned of some Chinese cases in which CSA members lent or donated money to farmers who were hit by typhoons or other weather emergencies and lost crops and/or infrastructure (e.g., greenhouses). So, while less likely to engage members on advisory committees, Chinese CSAs are readily engaging members in providing needed financial support.

Unlike Canadian CSA farms, it is common for Chinese CSAs to rent gardening plots to their members. For example, almost half of the CSAs we surveyed set aside a parcel of land for renting out to consumers or members who wanted to produce their own food, or simply enjoy family time in the countryside (leaving most of the responsibility for growing to the CSA farm staff). This type of consumer engagement is different from workshare arrangements prevalent in Canada. In a workshare, the member helps produce goods for all the CSA members. In China, CSA members work in these rented plots to produce for their own consumption. While Canadian CSAs strongly encourage members to visit the farm, and enjoy on-farm events, the intent seems to be more focused on building awareness of where food comes from. In China, CSA members seem to be trying to take more control over their food in an environment where fears of food adulteration run high. In China's highly urbanized environment, CSA members may experience a greater intensity of urban life, and are strongly pulled to the lifestyle aspects of just being on a farm, which correlates with the frequent references we heard to the pursuit of fresh air and healthfulness.

Community organizing

Scholars have evoked the idea of "food citizenship" (Welsh & MacRae, 1998) to describe how producers and consumers in alternative food networks move beyond buying and selling food, toward shaping state and/or global policies that impact the broader food system. This scholarship

contests the view that CSAs are 'simply' market-based initiatives focused on individual consumer behaviour, arguing that instead they are best understood as complex entanglements of market and non-market relations that are "collectivising consumption" (Johnston 2008, p. 243) and establishing "collective subjectivities" around food (Levkoe, 2011, p. 691). This framing in the Global North is based on a long history and culture of a civil society distinct from the state and the market. The situation in China is remarkably different and independent civil society is only recently emerging. China's CSA operators sit in an authoritarian context where there is no clear historical separation between the private and the public, and the boundary between what is permitted and prohibited is in constant flux. Yet our research suggests that in both Canada and China, CSA operators are frequently food activists deploying grassroots community organizing strategies.

Since the beginning of the movement in Canada, CSA farmers have been involved in building coalitions, community organizing, and advocacy for food sovereignty (Ashiabi, 2000). CSA farmers we interviewed all belong to and are active in several different civil society organizations (e.g., National Farmers Union, Ecological Farmers Association of Ontario, Organic Council of Ontario, Canadian Organic Growers) and many take leadership roles (see also Koç, 2008; Levkoe, 2014). CSA farmers told us that it is through these organizations and coalitions that they are able to expand the CSA movement and have a voice in shaping social, economic, and ecological policies that matter to them. Some of the key advocacy themes and issues that farmers mentioned to us during our interviews included anti-GMO campaigns, creation of local food system councils/roundtables, calling for fair trade initiatives, advocacy for more scale-appropriate food regulations, challenging economic policies that advantage large farms over small, and supporting international food sovereignty organizations such as La Via Campesina.

In comparison, community organizing among Chinese CSAs takes a unique form, typically more localized, non-confrontational, gradual, and fragmented (Ho & Edmunds, 2008). Schumilas and Scott (2016) documented how China's CSA operators are building reflexive practice, using the internet to expand their reach and challenge the state, and developing influential alliances. In this respect, the support of Renmin University of China's School of Agricultural Economics and Rural Development, and NGOs such as the Beijing-based Liang Shuming Rural Reconstruction Centre, the Hong Kong–based Partnerships for Community Development, and the US-based Institute for Agriculture and Trade Policy demonstrate the emergence of a supportive academic and NGO environment for the development of Chinese CSAs, as well as a context in which forms of advocacy are emerging.

These organizations not only provide assistance to solve problems in farming and management, but also facilitate coalitions that build solidarity among and beyond CSA operators. Renmin University of China and the Liang Shuming Rural Reconstruction Centre, for example, have been organizing annual CSA symposia since 2009, when the first group of CSA farms had just emerged in China. The symposium has grown each year since (to more than 1,000 participants in 2019) and is attracting interest from diverse social groups as well as the state. In

addition, a renowned scholar at Renmin University of China in Beijing, Professor Wen Tiejun, initiated and facilitated the establishment of the China Social Ecological Agriculture Alliance, which was officially registered as a social group in 2017. The Alliance, led by Shared Harvest CSA Farm in Beijing, has been actively promoting food education in schools through their "Son of the Earth" project.

In both countries, we found that CSA operators invest significant time using these alliances to enlarge their networks and build ties with members of other nascent civil society groups, environmental NGOs, and the media. However, in China, these linkages emphasize personal more than organizational connections in order to avoid the risk inherent in forming official and overt multi-network movements (Schumilas & Scott, 2016).

Discussion and conclusion

This comparison reveals that in both countries, CSAs sit at a highly paradoxical moment in which consumers are seeking higher quality food and reconnections with its production. Yet at the same time consumers are demanding greater choice, cheaper food, and more convenience, while markets and farms are consolidating in scale and it is difficult for small-scale producers to earn a living. In this context, the boundary imagined to divide alternative markets from mainstream markets is becoming blurred. Consumers seeking individualist consumer responses drive CSA adaptations, yet at the same time CSA operators are engaged in non-market relations such as (re)connecting producers and eaters and establishing collective subjectivities around food. We observe that CSAs in both countries manifest these contradictory characteristics, raising questions about the definition of CSA.

The ownership structures, land tenure, member engagement, and risk-sharing characteristics of CSAs have all evolved significantly to adapt to local conditions. The original CSA concept was built on a holistic philosophy that, in contrast to a commoditized food system, emphasized empowerment of both producers and eaters. After interviews and visits with hundreds of CSA farmers in two countries, we see the idealism of the early movement being challenged. New, young, urban, middle-class people are starting CSAs and infiltrating the movement with a new pragmatism. In efforts to support their livelihoods, CSA operators are modifying the model to give consumers greater choice and to soften the expectation of consumer risk sharing. Considering these changes alone, we might conclude that CSAs are becoming just another "marketing channel" for farmers trying to capture greater value in the marketplace.

Despite the trend of CSAs becoming more market oriented, they demonstrate strong egalitarian motivations that intermingle with the pragmatic, including rediscovering rural and agricultural traditions, responding to environmental crises perpetuated by productivist agriculture practices and policies, and a desire to supply high-quality food. Our research suggests that, in both countries, CSA operators put a high priority on and allocate resources toward activities that build community, reconnect eaters with the source of their food, demonstrate an ethics of care

for land, and engage in community organizing for food system change. CSAs are not simply sites of material transactions. They are also places where community is being built and hegemony is being challenged.

In both Canada and China, CSA operators are struggling to maintain the movement's original values in a context of growing social inequities and deepening consumer capitalism, while trying to earn a living. The constant evolution in the CSA movement poses a definitional challenge. Amid the diversity of approaches, what makes a CSA a CSA? Risk-sharing was a definitional element of the original CSA. Yet our research suggests CSAs are moving away from risk sharing and adopting more flexible payment mechanisms. However, other original tenets of the CSA model remain, and are, in our observations, strengthening. Community engagement and member reconnection is taking new forms in China. New digital technologies are being employed by CSA operators to facilitate these reconnections. Moving to online marketplaces may be a way for CSA farmers to increase scale efficiently, and newer technologies are allowing for full traceability and transparency to the farmer and their production methods. CSA farmers are trying to find new and more ways to connect and learn from each other across scales, and CSA operators are forming new networks and alliances within and beyond the movement.

By using a framework that examines CSAs from multiple dimensions, we see that they remain a complex phenomena, not explained by economic considerations alone. Indeed, we find the unifying characteristic of CSAs in both contexts is a focus on (re)connecting producers and consumers and on ecological forms of production.

The paper does not intend to examine the impacts of the variations in the political economic context within each of the two countries. Yet we believe this is a valid and promising research question for future studies. In China, the variation of economic conditions has shaped the operation of CSAs in that most Chinese CSAs are located near major cities such as Beijing, Shanghai, and Chengdu. The different economic conditions across different regions might also lead to variations in agricultural supports in the form of subsidies that these CSAs might receive from provincial and local governments. That said, there does not seem to be a significant difference in terms of the difficulty of accessing labour across the country, given that most CSAs are located close to major cities that offer more appealing job opportunities to the younger generation. As a consequence, most hired laborers are senior citizens from nearby villages. On the other hand, we do not see considerable political variations within China that may have an impact on CSA operations in different regions. This is explained by at least two factors. First, CSAs are still quite nascent and marginal in the current agrifood system in China, and the state plays a limited role in directly shaping their operations. The impacts of the state (e.g., facilitating land access) are often not associated with the local political environment, but rather personal connections among CSA operators and state officials. Second, in the case that the state's policies are influencing the CSA operation, the top-down nature of policy implementation in China ensures a relatively homogeneous orientation of agrifood and land-use policies in the country.

A key issue that this paper addresses relates to studies of alternative food networks, such as CSAs, which have been struggling with the question of whether these initiatives are a type of

utopian entertainment for a few middle class consumers, or if not, are they the beginning of a political struggle that configures new food-system relations (Goodman & Dupuis, 2002). Our response is that they are both. CSAs in both Canada and China manifest hybrid and sometimes contradictory characteristics. These findings help us move beyond binary thinking that can assume CSAs are posed in opposition to mainstream food systems. Following other scholars, we suggest that the hybrid and contradictory characteristics of contemporary CSAs demonstrate a mix of capitalist and other-than-capitalist economic logics (Andree et al., 2010; Ballamingie & Walker, 2013; Cameron & Gordon, 2010). Using CSA cases in Canada and China, this paper reveals that the capitalist economic logic is reflected in the deviation of CSAs from their original risk-sharing principle to give consumers greater choice. In parallel, the other-than-capitalist logic is underpinned by the social and environmental values that CSAs still retain, which emphasize community building, producer-consumer reconnection, and environmental sustainability. In terms of the ecological and political relations, the new developments of CSAs also blend traditional, organic, and productivist ecological relations (Egelyng et al., 2013), and demonstrate both individualist and civic collectivist politics simultaneously (Lamine et al., 2012). Although it would be worthwhile for researchers to determine whether these arguments hold beyond Canada and China, we argue that CSAs do not clearly fit into either/or categories of mainstream or alternative. Rather, they need to be seen as hybrid systems with a "yes-and-also" nature, or perhaps, given the research setting, one that is "yin-yang".

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Original Research Article

A participatory study of the health and social impact of a food centre in Ottawa, Canada

Aganeta Enns[a*], Myddryn Ellis[b], Tracey O'Sullivan[a], Peter Milley[a], and Elizabeth Kristjansson[a]

[a] University of Ottawa
[b] McGill University

Abstract

Food insecurity is a pervasive and persistent issue across Canada, where a growing number of people are accessing food banks. Conventional food banks may offer relief for immediate needs but typically have limited capacity to address longer-term food insecurity. This paper focuses on the Parkdale Food Centre in Ottawa, ON, which provides food assistance alongside a range of programs and initiatives designed to address food insecurity and related needs in its community. This qualitative study aims to examine how participation in the programs at the Parkdale Food Centre influences the physical, mental, and social health of people who access the food centre. Semi-structured interviews and a participatory photovoice project were conducted with people who access the food centre. The results indicate that people who access the food centre perceived a positive influence of the programs on their food, health, and social needs, particularly with respect to improved access to fresh foods, connections to social and health resources, and reduced stigma. Incorporating additional food, health, and social programming into an existing food assistance program may help ameliorate elements of food insecurity and associated negative outcomes within communities impacted by this issue.

Keywords: Food insecurity; photovoice; qualitative research; food banks; food centres

Introduction

*Corresponding author: aenns022@uottawa.ca
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Food insecurity, which refers to having inadequate or uncertain access to a sufficient quantity of food and/or inadequate quality and variety of foods due to financial constraints, is a persistent issue in communities across Canada that has a negative impact on approximately 8.3% of households (Roshanafshar & Hawkins, 2015). Experiences of food insecurity can range from worrying about food running out to skipping meals or going without eating for a whole day (Tarasuk et al., 2016).

Food insecurity has been linked with consuming a lower quality diet and with poorer nutrient intake (Kirkpatrick & Tarasuk, 2008). Compared to food secure populations, people experiencing food insecurity report consumption of fewer fruits and vegetables and regular intake of more foods that are inexpensive, calorically dense, and low in nutrients (Holben, 2012; Neter et al., 2017). These calorically dense but low-nutrient foods may help connect the paradoxical finding that food insecure populations, particularly women, are at an elevated risk of both lower nutrient intake and obesity (Cheug et al., 2015; Laraia, 2013). Prior studies indicate that food insecurity is associated with increased risk of poorer overall physical health and chronic disease (Ramsey et al., 2011; Seligman et al., 2010). Furthermore, adverse mental health outcomes have been linked with food insecurity, including higher levels of perceived stress, symptoms of depression and anxiety, and lower self-esteem (Laraia, 2013; Leung et al., 2015; Pryor et al., 2016). People impacted by food insecurity also tend to report lower social support and community cohesion (Boston et al., 2013; Gichunge et al., 2015; Leung et al., 2015).

Interventions to address food insecurity

In Canada, food banks were initially established in the 1980s as a resource for short-term relief of urgent food need. They are typically one of the only sources of immediate assistance for food insecure individuals. While the organizational structures of these agencies differ, they often rely on charitable donations from public and private sources (Campbell et al., 2013; Tarasuk et al., 2014). In the context of the present study, food banks are defined as not-for-profit agencies that distribute food, typically in the form of grocery items, to individuals. Food banks are often limited in their capacity to provide adequate quantities of food to meet clients' needs and frequently need to implement access restrictions to ensure their food supply can meet the demand (Tarasuk et al., 2014). The limited variety and quality of foods available, including few fresh and nutritious options, has been described in previous literature (e.g., Gany et al., 2013; Tarasuk et al., 2014). In addition to food supply limitations, clients may experience social stigma or shame when accessing a food bank (Van der Horst et al., 2014). People who are food insecure may view the embarrassment or shame of seeking assistance at a food bank as a barrier to accessing these resources. However, people who access food banks have reported a sense of relief if they have a welcoming experience when accessing the food bank (Purdam et al., 2015).

In one month in 2016, Food Banks Canada reported that 860,000 people across the country accessed a food bank, which represents a 28% increase compared to 2008 (Food Banks

Canada, 2016). While food banks can facilitate short-term improvement of food security (Roncarolo et al., 2016), they often have a limited capacity to help clients meet their dietary needs and alleviate chronic food insecurity. Despite this, many families rely on these resources to meet their monthly household food needs (Feeding America, 2014). With the increasing number of people turning to food banks, and many relying on these resources on a long-term basis, some observers have noted that conventional food banks have limited capacity to address the causes of food insecurity (Loopstra & Tarasuk, 2012; McIntyre et al., 2016). It has been argued that the ubiquity of food banks may even diminish public perceptions that people are entitled to adequate access to food and that formal government responses to this issue are needed (Riches & Silvasti, 2014). Traditional food banks were not intended to address long-term food insecurity or the causes of this issue (Riches & Silvasti, 2014), but these established community agencies may offer an effective setting for advocacy and for targeting resources to address factors that contribute to food security (Greater Vancouver Food Bank, 2018).

Shifting strategies in food banking

A recent review suggests that food security outcomes may improve when food banks work to identify and address the food needs of the people they serve and offer more perishable foods (Bazerghi et al., 2016). Descriptions of how food banks have adapted existing operations or adopted new programs to better address the needs of the people they serve have emerged in recent literature. For example, a survey of food banks in the United States found that nutritional policies and efforts to increase the availability of fresh produce are increasingly common (Campbell et al., 2013). Food banks have changed how they operate and have adopted new programs in order to offer more nutritious foods (including produce), nutrition education, cooking classes, and food demonstrations, resulting in reported improvements in dietary outcomes (Caspi et al., 2016; Dave et al., 2017; Handforth et al., 2013; Martin et al., 2013).

There has been heterogeneity in the cases of food banks that have shifted how they operate to better meet a wide range of needs of the people who access food banks. For example, it has been reported that the dignity of clients is promoted when food banks allow individuals to choose the food items they wish to access rather than providing food hampers, which are orders (e.g., bags or boxes) of grocery items that are pre-packed by volunteers or staff for distribution to individuals who access the food banks (Mukoya et al., 2017). Programs to empower and support individuals in developing skills, finding employment, budgeting, and building self-efficacy have also been implemented successfully at food banks. Food banks may be an effective community access point for offering targeted food security, health, advocacy, and social programs (Greater Vancouver Food Bank, 2016; Levkoe & Wakefield, 2011).

The Parkdale Food Centre (PFC) in Ottawa, ON is an example of a centre that began as a food bank but radically changed its approach to addressing food insecurity by drawing on a number of the strategies discussed above and inventing their own. Their approach is described in

more detail below. The purpose of the present study is to conduct a pilot study with the Parkdale Food Centre to examine the influence of their approach on the community members it is intended to serve. In this paper, we describe participants' experiences with PFC, including the social and emotional experiences of accessing a food centre, and how they perceive changes in their diet, physical health, mental health, and social support since engaging with PFC.

Methodology

Study context

The study was conducted at the Parkdale Food Centre, which is located in an urban area of Ottawa, ON. This not-for-profit organization is part of the Ottawa Food Bank's distribution network. The mission statement at PFC is "to build healthier, more connected neighbours and neighbourhoods through good food, innovative community partnerships, and by challenging inequalities in order to create lasting impacts" (Parkdale Food Centre, 2019). A distinguishing feature of PFC is that they refer to people who access the centre as *neighbours* to emphasize a welcoming sense of community. PFC provides food assistance with a focus on providing nutritious foods, including fresh produce, and avoiding low-nutrient 'junk' foods. They encourage donors to give healthy foods and provide a "good foods list" for suggested donation items. Rather than distributing food hampers, PFC employs a "choice model" to distribute orders of grocery items to those seeking food assistance. People who access PFC are invited to walk around a food display area with a volunteer and select the foods within each category that they would like to take home. Approximately one-third of the people who access PFC reside outside of the centre's defined region in Ottawa. People seeking assistance from outside the defined region were referred by healthcare professionals to PFC so they can obtain access to more fresh and healthier foods. Individuals may access PFC for an order of grocery items once per month; however, there are no restrictions on how often individuals may access PFC for other services or programs.

PFC focuses on social justice, community awareness, and advocacy efforts for changing policies to better address issues of food insecurity. PFC facilitates community programs onsite at the Food Centre that are available to all people who access PFC. Examples of programs include: cooking classes, community meals, nutrition information programs, a community garden, financial advice meetings, programs facilitated by a social worker, and referrals to a broad range of other community resources. Many of the neighbours volunteer with the various programs at the centre. While PFC still offers food banks services (i.e., distributing food directly to individuals), it is herein referred to as a food centre rather than food bank to better represent the

scope of food and community programs offered in addition to food bank services as they have been defined above.

Study context

The overarching research questions for this study were:

1. How do participants perceive their experiences, including social and emotional experiences, in accessing programs and services at PFC?
2. How do participants describe the effect of accessing PFC on their lives, including aspects of their diet, health, and social experiences?

A multiple-methods qualitative approach was employed to investigate the study aims. The study was conducted over a one-year period that involved a participatory photovoice project and semi-structured interviews that were conducted before the photovoice project at the beginning of the study period and a follow-up cycle of semi-structured interviews that were conducted after the photovoice project at the end of the study period.

Data collection

The sample of 12 participants took part in initial semi-structured interviews at the beginning of the study period conducted in a private room located in the same building as PFC. The interviews ranged in duration from 20 to 55 minutes. The interview guide included questions pertaining to overall experience and interactions at PFC, as well as perceived diet, physical health, mental health, and social support. Data were transcribed verbatim and anonymized prior to analysis.

After completing the initial interviews, the 12 participants were then invited to take part in the photovoice project. Photovoice (Wang & Burris, 1997) was selected to incorporate an established participatory methodology that would allow participants to photograph and narrate their experiences in interacting with the Food Centre. Photovoice was selected in combination with interviews to empower participants to identify topics, concerns, and experiences that are most salient from their perspectives (Palibroda et al., 2009). This method allows participants to present priority concerns, create a critical dialogue, share experiences, and reflect on strengths through photographs and discussions. Moreover, previous literature has indicated that photovoice expands the representation of participant voices and realities that are not often represented in research (Hergenrather et al., 2009). Incorporating a visual method (i.e., sharing photographs in the photovoice project) was used as a means for participants to share what is most prominent and important from their perspectives and stimulate discussion about experiences at PFC (Hansen-Ketchum & Myrick, 2008; Wang & Burris, 1997). The photovoice project took place over the course of five group meetings, held at approximately one-month intervals. The average duration of the group meetings was approximately one hour. At the first meeting, participants were

provided with information on photovoice, shared photography tips, and learned how to use the cameras provided. This meeting was for information purposes and was not audio-recorded. Participants were asked to take photos that show their experiences as they relate to programs at PFC. At the second to fifth group meetings, participants shared their photos and discussed the meaning and relevance of each photo. The photos stimulated open group discussions on experiences of accessing PFC where photographs guided the dialogue and critical group discussions and allowed participants to identify the most important and salient topics. These discussions were audio-recorded and transcribed verbatim.

After the photovoice project concluded, all 12 participants that completed the initial interviews were invited to complete a follow-up interview at the end of the study period. They were asked about their experiences and interactions at PFC since their initial interviews, including if and how the programs at PFC have impacted their lives. They were prompted to provide any feedback on aspects of PFC that they believe could be improved. Data collection occurred between March 2016 and March 2017. Approval was obtained from the University of Ottawa Research Ethics Board prior to data collection.

Participants

Twelve adults who access PFC were recruited to participate. Participants were recruited in-person at PFC. Two research team members approached people in the waiting area of PFC to provide information on the study and invite individuals to participate. People who expressed interest in participating were asked to write their preferred contact information (e.g., phone or email) and place it in a locked drop box. The research team then contacted participants to schedule one-on-one interviews. The sample was limited to participants who were proficient in English and were over the age of 18. The sample included six female and six male participants whose ages ranged from 29 to 61. Four of the 12 participants reported living with dependent children and two indicated current pregnancy. Length of time since first accessing the services and programs at PFC ranged from six months to over five years. All participants reported accessing other food banks prior to seeking assistance at PFC. Two of the 12 participants indicated they were employed at the time of the initial interview.

Four of the initial 12 participants interviewed completed the photovoice project. All 12 participants who completed the initial interview were contacted with an invitation to complete a follow-up interview at the end of the study period. Five of the 12 participants, including all four participants who took part in the photovoice project, completed the one-year follow-up interviews. Three participants were lost to follow-up after completing the initial interview because the research team was unable to make contact (e.g., out-of-service phone number). The remaining participants who did not complete all aspects of data collection explained they were unable to commit their time to the study due to health or other issues of personal circumstance. This attrition is consistent with previous literature that has documented the challenges of

retaining participants from groups that are hard-to-reach or may be considered marginalized (e.g., McKenzie et al., 1999). All participants reviewed and signed a consent form approved by the University of Ottawa ethics review board.

Data analysis

All one-on-one interviews and photovoice meetings two through five were audio-recorded and transcribed verbatim. Thematic analysis was conducted with the interview transcripts and the data collected through the photovoice group meetings to summarize emergent themes (Thomas, 2006). The data were coded and analyzed using NVivo10. Codes were developed by two independent coders and agreed on by the research team. Codes triangulated from the baseline interviews and the photovoice data were summarized and brought to the follow-up interviews with participants, who were asked to read the data analysis summary and confirm whether they perceived it to be accurate, what they would change or add, or any other thoughts they had on the summary. This feedback from participants was then used to refine the final themes. This last step also involved triangulating themes from both the photovoice and interview data, during which the research team analyzed coding reports to identify themes through iterative revisions until consensus was reached. Verbatim quotes from interviews and photovoice meetings, as well as select photographs that had been shared in the photovoice project, are provided below to illustrate these themes. Photographs shown were limited to those that do not contain identifying details in order to protect participants' confidentiality.

Results

Participant experiences at PFC and the perceived influence of accessing PFC have been summarized into three themes based on the triangulated analyses of the interview and photovoice data: food and nutrition, the community hub, and dignity. The three themes summarize how participants described the influence of PFC on their access to food, including healthy food options, connections within the community, and overall social and emotional experiences of accessing the Food Centre.

Food and nutrition

Participants described the food offered at PFC as being of suitable quantity, quality, and variety to meet their food needs. Participants discussed the wide variety of foods, the availability of fresh fruits and vegetables, and described being satisfied with the quantity of food received. A photograph shared by one participant of the photovoice project, shown in Figure 1, shows a display of fresh produce at PFC.

Figure 1: Photograph of fruits and vegetables taken at PFC.

In the initial interviews, nine out of the 12 participants interviewed mentioned the high quality, freshness, and/or variety of foods available at PFC. The participant who shared the photograph shown in Figure 2 explained that these were grocery items obtained from the Food Centre and discussed the amount and variety of fruits and vegetables that they obtained from PFC. During the interviews and photovoice project, participants also spoke favourably about their access to food at PFC in comparison to food they had received at other food banks or with respect to their difficulties in purchasing food for a healthy diet.

> It's the healthiest food bank I've ever been to around here. Actually, because I find a lot of food banks are all high carbs, high carbs to fill you up or whatever. This is, [PFC] look for your health. They give you good foods to eat, and it's the proper foods to eat. It's good. (Participant 6)

Figure 2: Photograph of grocery items obtained at PFC.

Several participants associated their access to services and programs at PFC with eating a healthier diet. Examples they provided about their healthier eating included reduced consumption of 'junk' food, increased consumption (in quantity and variety) of fruits and vegetables, and more frequent preparation of 'healthy' meals. One participant discussed how these dietary changes helped them to meet a goal to reach a healthy body weight. Participants perceived food options as being accessible for those with specific dietary needs related to managing chronic conditions or other dietary restrictions.

> They offer fresh fruits and vegetables and they also give you foods that you can make instead of pre-packaged. So, it's a lot healthier. And that helps you if you want to have a healthier diet. (Participant 11)

> I'm eating more now. I used to eat once a day thinking I'm going to get fat. Now they're [PFC] teaching me about eating nutritionally and I'm eating more and I'm not getting fat, I'm losing weight. (Participant 10)

Information and programs on nutrition and cooking facilitated at PFC were discussed in eight interviews. Participants discussed learning new information and skills at the programs facilitated at PFC, including the regular community kitchen programs. Participants also described learning new information through the food of the month program at PFC, recipes, and

information provided by volunteers or staff on how to prepare and incorporate new foods into meals.

> At the food bank, they're starting to do these things now where they're showing you what sort of foods you can make with the actual fruit or the vegetable, how you can incorporate it, the calories, everything, because it's so important. (Participant 7)

The community hub

Several participants discussed the role of PFC in relation to their social support and sense of community belonging. They explained the need for space in the community to meet and talk with other people. PFC was described as a place to drop-in for social interaction with others. Participants talked with their neighbours in the waiting area and explained that they felt more connected in their community because of interactions at PFC.

> I just continued to come along for the socialization right, when you move to a city, besides your family, who are you going to socialize with? The centre's been helpful, just to be able to come here, a dependable place where the hours are dependable where you can count on it being open, there's coffee. (Participant 1)

> To me this is very much a social service. The cooking classes and so forth because, well I can drop in here any day it's open. (Participant 12)

Involvement in programs facilitated at PFC, such as the community meals, emerged in several interviews and group discussions. Moreover, participants described the success PFC has had in connecting with local businesses and the positive impact of these community connections. The neighbours discussed the donations received by local businesses, the presence of PFC in the community, and events or programs offered jointly by PFC and local businesses. One participant shared a photograph taken at a breakfast event that was offered jointly by PFC and a local restaurant (Figure 3).

Figure 3: Photograph of breakfast at an event hosted by PFC and a local business.

Knowledge of, and access to, other community resources was facilitated through interactions at PFC. Information about programs, resources, and services in the community were shared during interactions with other neighbours. Information and referrals were also made available through posters and pamphlets at PFC and through interactions with volunteers or staff members. Participants also discussed the need for non-food essential items, such as toothbrushes, diapers, feminine hygiene products, and toilet paper. Moreover, the importance of the additional non-food resources available at PFC, including access to computers and books in the waiting area, emerged in the data. The photograph in Figure 4 shows the availability of books and community information in the waiting area.

> I just felt like a sense of community when I first came here it was just like I felt safe and sometimes I haven't been able to feel that way. So, I felt like this was my hub, like a ticket to know the whole community. (Participant 11)

Figure 4: Photograph of the library in the PFC waiting area.

In addition to connections to other community resources or programs, seven out of 12 participants found employment, educational, or volunteering opportunities through connections made at PFC. Participants explained volunteering at PFC was encouraged among neighbours, and several explained that volunteering made them feel involved and increased their social connections in the community.

> I volunteer here now every morning or in the evening. Because of the volunteering…I've made more friends. (Participant 10)

> There's always extra volunteers. They're all volunteers there, everybody is kind of helping out everybody. Everybody that goes there [PFC] is comfortable enough to lend a hand when they need to. Or if something needs to get done people are always willing to help, it's nice. (Participant 5)

Dignity

Throughout the interviews and photovoice project, the participants discussed how a sense of dignity underlined their emotional and social experiences at PFC including their overall experience of accessing the Food Centre and in their interactions with staff and volunteers. They described this in terms of how the food was distributed as well as the inclusivity and responsiveness of PFC. Four participants compared the experience of obtaining food at PFC to picking out foods at the grocery store. This includes the experience of walking around the food centre to see what foods are available, selecting the ones they would like, and having options. Participants reported preferring the choice model compared to receiving pre-packed food hampers.

> I like the way we go through and pick what we want. At the other place, it was basically they made a list of what you could have and what you wanted. Somebody would go back and fill up your bags and sort of, there you go. There was always one thing that was missing. (Participant 2)

While participants explained that the choice model was preferred, one participant noted issues they perceived with the food distribution method. As illustrated in the quote below, the participant noted concerns with long line-ups and lack of consistency in the food options available for people who do not arrive early:

> I come sometimes like 45 minutes early, but there's already up to 20 people ahead of me…the first crowd leaves with all of [food available at PFC] and for the last people is like not much. It's really just what's been picked through and what remains. (Participant 5)

The welcoming and inclusive environment at PFC emerged as a common theme throughout the interviews and photovoice groups and was mentioned by all 12 participants. Participants described being greeted by friendly volunteers or staff members when first entering the centre. The physical environment at PFC was described as clean, safe, family-friendly, and comfortable. Some expressed surprise when first visiting PFC as it exceeded their expectations.

> It didn't look like a food bank, it had more of a cozy feeling to it. Most food banks are kind of, you know, in the basement of the church and a sort of stale environment… [PFC is] a little bit like a living room feeling. A very friendly, welcoming feeling. So that certainly struck me. They had free coffee and a lot of food banks don't do that. (Participant 4)

Staff members and volunteers were described as non-judgemental, caring, and responsive to the needs of the neighbours and community. The participants discussed how people may

anticipate shame before their initial visit to the food centre, but after visiting they feel they can have pride and dignity at PFC. One participant described this in the quote below:

> You can see that when they first get here, they're shy. But then the next time they come, their shoulders are up, they know what this place is all about. (Participant 10)

Discussion

The themes triangulated from the interview and photovoice data reveal how people perceive the impact of PFC on their food security, the social and emotional experience of accessing the Food Centre, and facets of their lives that extend beyond basic food needs. In line with past research (Kirkpatrick & Tarasuk, 2008), the participants from the present study described the challenges of affording a balanced diet while living with a low income. In contrast with prior literature on traditional food banks, the food received at PFC was described as healthy, including fresh fruits and vegetables. The food available at food banks has previously been described as limited in quality and as mostly pre-packaged food with little nutritional value (Gany et al., 2013; Loopstra & Tarasuk, 2012; Tarasuk et al., 2014).

People with restricted diets (e.g., due to medical conditions or allergies) may be unable to obtain suitable food or have limited options at a traditional food bank (Gany et al., 2013; Minaker et al., 2014). In contrast, the participants of the present study indicated that PFC's choice model allowed them to obtain suitable food to meet their needs, including appropriate food options for those with restricted diets. Participants explained that with the choice model of food distribution, they received foods that are more appropriate to not only dietary restrictions but also food preferences. Thus, this model of food distribution may also reduce waste, as participants explained they were more likely to eat the foods they received at the food centre if they selected it themselves. The impact of the choice model also extended into discussions of dignity and respect. Participants explained it felt more normal and dignified to make their own choices about what foods they would like from the food centre, comparing the experience to shopping at a grocery store.

Dignity emerged as a common theme throughout the interviews and photovoice project. Previous research describes the experience of embarrassment, shame, and stigma associated with seeking assistance from a food bank (Loopstra & Tarasuk, 2012; Van der Horst et al., 2014). However, the safe and welcoming environment at PFC, including friendly volunteers and staff, opposed the expectations of shame and stigma that people seeking assistance may hold. PFC promoted respect and dignity by seeking and listening to feedback provided by people who access the food centre as well as facilitating opportunities to get involved at the food centre. Participants provided specific examples of issues that had been raised and were then addressed

by the food bank. Furthermore, several of the participants interviewed for this study also volunteered at PFC.

In addition to providing food assistance, participants discussed how PFC worked to foster a sense of belonging and community. Their descriptions included how the use of shared spaces (e.g., a large dining table in the waiting area), and an atmosphere that is perceived as welcoming and non-judgmental, served to facilitate a friendly and social environment. For example, participants reported dropping into PFC for social reasons, outside of times when they visited to obtain food. The programs and activities facilitated by PFC further served to foster social interaction among community members. Programs that facilitate social interaction may serve to address unmet needs for some individuals, as food insecure populations often report lower levels of social support (Boston et al., 2013; Gichunge et al., 2015; Leung et al., 2015). Many participants described their challenges with lack of support, and how the spaces and programs for social interaction at PFC were a needed resource in the community.

Food banks may serve as effective access points to target populations who may benefit from a range of food, health, and social programs. While food assistance is generally what brings people to access a food bank for the first time, participants explained that they obtained more than emergency food assistance from PFC. PFC offered access to additional programming, relevant information, and connections to meet food, health, and social needs beyond their short-term food insecurity. While food banks may not offer a solution to the problem of food insecurity, these existing agencies may be effective locations to target health and social resources for those impacted by food insecurity. These types of services may serve to address longer-term needs and, for some, cultivate a sense of empowerment that encourages them to pursue educational or employment opportunities. In turn, these pursuits may contribute to addressing the causes of food insecurity.

Participants acknowledged that the presence of the food centre within the community was an important factor in PFC having the capacity to offer the foods, products, and programs described above. In addition to creating a sense of belonging within the centre itself, the team at PFC has made efforts to connect with community groups and businesses. These connections have allowed PFC to improve the variety, quality, and quantity of food available, the availability of other products (e.g., hygiene products), and create opportunities to connect people with programs and events facilitated in collaboration with community businesses and groups. Connections within the community and broader area (e.g., municipality) may also serve to spread awareness and advocate for changes to better address issues of food insecurity. While themes addressing advocacy, efforts did not emerge in the present study, future research may examine cases of food banks or food centres that integrate advocacy into their work and the impacts of such efforts.

There are limitations that should be considered when interpreting the results of this study. First, the generalizability of these results may be limited due to the small, convenience sample that was recruited. Participants contrasted their experiences at PFC to their prior food bank experiences; however, these results were based on participant recollection alone as a comparison

food bank was not included in the present study. Moreover, participants did not provide much description of aspects of PFC they find to be negative or in need of improvement. Data collection occurred within the same building as PFC, which may have contributed to how comfortable participants felt with being critical. This may be a potential bias that should be noted when interpreting the findings presenting above. The results from this qualitative study may inform future studies. For example, future research may consider longitudinal methods to examine different approaches amongst food banks to provide further insight into how centres, such as PFC, may impact the food security and well-being of the people who access them.

Conclusions

The present study elucidates the impact of one community food centre on the diet, health, and social experiences of the people who access the centre. Participants explained that PFC not only made a difference in their access to food, including fresh and nutritious food options, but also served an important role in their community. The food centre was described as a place for social interaction and community connections to resources. While food assistance may not provide a solution to long-term food insecurity, these findings demonstrate how an existing emergency food assistance program can expand its approach and programming to address community food insecurity and related needs.

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Original Research Article

Starving to be a student: The experiences of food insecurity among undergraduate students in Nova Scotia, Canada

Meredith Bessey[a*], Lesley Frank[b], and Patricia L. Williams[c]

[a] Mount Saint Vincent University[1]
[b] Acadia University
[c] Mount Saint Vincent University, FoodARC, Dalhousie University Healthy Populations Institute

Abstract

Household food insecurity (HFI) exists when access to food is inadequate or insecure due to financial constraints, and is an issue of increasing concern among postsecondary students who face barriers to food access due to precarious finances. The goal of the current study was to explore the experience of HFI among university students in Nova Scotia (NS), including barriers and facilitators, and potential policy solutions to the issue from the perspective of students. Twelve semi-structured, in-depth interviews were conducted with students experiencing HFI from across NS. Phenomenological analysis was undertaken, using Radimer's model of HFI as a theoretical framework. Key aspects of the experience of food insecurity in this sample included all four dimensions of Radimer's model of HFI: quantitative, qualitative, psychological, and social, along with other elements, such as emotions related to the experience, and a desire to be independent from parents. The main contributing factor to student's difficulties accessing food was inadequate and precarious finances. Students highlighted various coping mechanisms, such as utilizing food banks, budgeting their money, and buying food in bulk. This study is an important next step to a better understanding of the experience of student HFI in NS, building on previous quantitative research. Findings suggest that while the experience of HFI has many

[1] Meredith Bessey was a honours student in the Department of Applied Human Nutrition and a research assistant at the Food Action Research Centre (FoodARC), Mount Saint Vincent University when she completed this work. She is currently a PhD Student at the University of Guelph.

*Corresponding author: besseym@uoguelph.ca
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similarities with the experience in other populations, students experience tensions between independence and reliance on their family and have unique struggles related to government financial supports. The findings point to necessary policy changes related to student funding programs, and suggest that relying on campus food banks to solve the issue of HFI among students is inadequate.

Keywords: Student food insecurity; phenomenology; finances; student funding; health disparities

Introduction

Household food insecurity (HFI), defined as when access to food is inadequate or insecure due to financial constraints, is recognized as a critical public health issue in Canada (Tarasuk et al., 2016). Experiencing HFI places members of the household at risk for various negative physical and mental health outcomes, including diabetes, poor oral health, and depression (e.g., Alaimo et al., 2002; Gucciardi et al., 2009; Muirhead et al., 2009). HFI among post-secondary students is a growing area of interest. Studies to date suggest that approximately 35-40% of post-secondary students on campuses in Nova Scotia (NS), Saskatchewan, Manitoba, and Newfoundland report experiencing HFI (Blundell et al., 2019; Entz et al., 2017; Frank, 2018; Olauson et al., 2018; Reynolds et al., 2018). These findings are consistent with those of a 2016 report by Meal Exchange, a national organization focused on campus food issues, which found an overall HFI prevalence of 39% across five Canadian campuses, with Dalhousie University in Halifax, NS, having the highest prevalence, at 46% (Silverthorn, 2016). These prevalences are triple those that have been reported for all Canadians (Tarasuk et al., 2016). Additionally, NS has consistently had the highest prevalence of HFI of all Canadian provinces. For example, 17.5% of Nova Scotian households experienced HFI in 2012, compared to nearly 13% of households nationally (Tarasuk, Mitchell, & Dachner, 2014).

Radimer and colleagues described, and Kendall and colleagues subsequently validated, four dimensions of food insecurity, at both the individual and household level – quantitative, qualitative, psychological, and social (Radimer et al., 1990; Kendall et al., 1995). This seminal work on individual and household food insecurity forms the basis of how HFI is measured in Canada and the United States (PROOF, 2018). The four dimensions are described in Table 1.

Table 1: Dimensions of food insecurity by Radimer et al., 1990.

	Individual level	**Household level**
Food Quantity	Insufficient intake	Food depletion
Food Quality	Nutritional inadequacy	Unsuitable food

Psychological Dimensions	Lack of choice, feelings of deprivation	Food anxiety
Social Dimensions	Disrupted eating patterns	Food acquisition in socially unacceptable ways

Table adapted from Kendall et al., 1995.

Additionally, HFI exists on a spectrum of marginal, moderate, or severe (Tarasuk et al., 2016). Marginal HFI captures worrying about running out of food or limiting food selection due to limited financial resources. Moderate HFI can involve compromising the quality and/or quantity of the diet due to financial constraints, while severe HFI is defined as missing meals, reducing food intake, and/or going days without food (Tarasuk et al., 2016). Research indicates that university students experience HFI across the spectrum. To illustrate, data from Memorial University of Newfoundland indicated that 31.3% of students experiencing HFI were marginally food insecure, 48.7% were experiencing moderate HFI, and 20.0% experienced severe HFI (Blundell et al., 2019). While students are arguably at risk of the negative health outcomes linked to HFI outlined above, they additionally are at risk of poor academic performance (e.g., Farahbakhsh et al., 2017; Olauson et al., 2018).

While various factors, such as lack of transportation, have been identified as barriers to food security for students (e.g., Frank, 2018), the most common barrier among students has been financial factors, such as cost of food, tuition fees, and inadequate income supports (Cheng, 2019; Entz et al., 2017; Frank, 2018; Maynard et al., 2018; Nugent, 2011; Silverthorn, 2016). Research to date has consistently demonstrated that international students, students who are employed, those who rely on government loans, those who are parents, or those who are of minority status are at higher risk of HFI (e.g., Blundell, et al., 2019; Entz et al., 2017; Frank, 2018; Olauson et al., 2018; Silverthorn, 2016; Reynolds et al., 2018).

Tuition rates in NS have consistently been among the highest in the country and continue to rise (Canadian Centre for Policy Alternatives, 2014; Statistics Canada, 2016), as do basic expenses, such as shelter and nutritious food (Newell et al., 2014). When students do not have sufficient funds for food, they use multiple coping mechanisms: working more, accessing a food bank, borrowing money or food from family or friends, using credit, delaying buying textbooks, finding free food events on campus, and/or stealing food (Bruening et al., 2016; Entz et al., 2017; Frank, 2018; Hughes et al., 2011; Maynard et al., 2018). Despite the well documented inadequacy of food banks and other charitable approaches to HFI, the food bank model has spread across nearly all Canadian post-secondary institutions (e.g., Silverthorn, 2016; Tarasuk et al., 2014). However, food banks are often utilized by a very small proportion (e.g., <10%) of students experiencing HFI (Entz et al., 2017; Frank, 2018; Hughes et al., 2011; Olauson et al., 2018). The low utilization of campus food banks in the face of consistent reports of the high prevalence of HFI among students suggests that food banks are not meeting the needs of students experiencing HFI, and that longer term solutions are needed.

While prevalence data tell us that HFI is common among Canadian students, it cannot capture the complexity of experiences of HFI. Only one qualitative study has been published exploring the experience of student HFI in the Canadian context (Maynard et al., 2018). This study involved interviews with 14 students who had compromised financial access to food. Findings indicate that participants normalized the experience of HFI while attending university, but also acknowledged the negative impacts that HFI had on their physical and mental wellbeing (Maynard et al., 2018). Considering the limited amount of qualitative research on this topic and given the broader context of rising food and tuition costs, it was important to learn more about the specific experience of student HFI, particularly in NS where prevalence is high, so as to better understand what contributes to students' experience and how to support university students to have better access to food.

Methodology

The current study utilized a qualitative approach and a phenomenological methodological framework. Phenomenological methodology is the process of understanding how a phenomenon, in this case, HFI, is experienced by the people it affects (Patton, 1990). In-depth interviews were conducted with undergraduate students in NS, in February to April 2017, in order to explore the phenomenon of HFI, to elucidate barriers and facilitators to food security, as well as to learn about potential policy solutions from the perspectives of students. Radimer's four dimensions of HFI were used as the theoretical framework that shaped the interview questions and analysis of data.

Ethical approval was obtained through the Mount St. Vincent University Research Ethics Board (REB), as well as through the REBs of St. Francis Xavier University and Cape Breton University; for the remaining universities in NS where the study was advertised, REB approval from MSVU was sufficient. Purposeful sampling was used to target undergraduate students who were at risk of HFI, consistent with previous literature (e.g., Frank, 2018; Silverthorn, 2016). Potential participants were recruited using posters on university campuses across NS, emails, social media posts, and word of mouth. Recruitment materials used the question "Do you struggle to afford the food you need and want?" in order to capture the interest of students who may be experiencing HFI. Participants were offered a $20 gift card to a grocery store for their participation in the study. Potential participants were contacted by telephone to screen for eligibility in the study before being enrolled. To be eligible to participate, students needed to be experiencing marginal, moderate, or severe HFI, as assessed by the Household Food Security Survey Module, the tool used to monitor HFI in Canada (PROOF, 2018). Students also needed to indicate that they were supported by a student loan, employment, and/or a government program, and were living alone, with other students, and/or with their children. Of the 21 students who

were screened for eligibility, twelve students met eligibility criteria for the study. All participants provided written informed consent.

Those eligible for the study were asked a set of semi-structured questions designed to explore Radimer's dimensions of HFI, which related to their typical eating habits, past or present experiences with HFI, ways they cope when accessing food is an issue, barriers and facilitators to their food access, and their perspectives on potential solutions to the issue of student HFI. The interview guide was adapted from Green-LaPierre and colleagues, who conducted a similar phenomenological study investigating HFI among low-income lone senior women in Halifax, NS (Green-LaPierre et al., 2012). Green-LaPierre's interview guide was modified to incorporate aspects pertaining to the specific experience of university students, based on published literature on HFI among students (e.g., Frank, 2018; Hughes et al., 2011; Maynard et al., 2018; Nugent, 2011). Sample interview questions can be found in Table 2.

Table 2: Selected interview questions

Type of question	**Question**
Icebreaker	What is your favourite meal to prepare and eat? What foods do you enjoy eating the most?
Main	Walk me through a typical day for you… what do you normally eat?
Main	Has there ever been a time *(since you have been a student in Nova Scotia)* when you had difficulty eating well?
Probe	What led up to your experience of having challenges in eating well/or getting enough nutritious food? How did this experience begin for you? What were the circumstances or events that triggered it?
Main	What is the biggest factor influencing YOUR ability to access the foods you need and want? What would help you the most to have better access to food?
Summary	What have you learned from your experience with food insecurity (if applicable)?

Interviews were conducted in English, audio recorded, and transcribed verbatim. Participants were given the opportunity to review their transcripts and summary notes for accuracy and clarification. Each participant was assigned a pseudonym. Data analysis took place simultaneously with data collection and was undertaken with support of MaxQDA (Version 12.3.0) software (VERBI GmbH Berlin, 2017). Recruitment and screening continued until the sample size was reached, allowing previous interviews to inform questions and probes in subsequent interviews. A phenomenological approach to data analysis was used. Briefly, the steps of phenomenological analysis began with epoché, where the transcripts were read from an open and naïve perspective, with no judgements (Patton, 1990). Following this was phenomenological reduction, where the phenomenon in question was described in text, by coding and interpreting the transcripts, using Radimer's dimensions of HFI as a framework, but also remaining open to new ideas that arose from the interviews (Patton, 1990). Common codes were then grouped into categories, to develop a description of student HFI. Coding was an iterative process, with codes emerging and evolving as the interviews progressed. The last step

was eidetic variation, where a structural description of the phenomenon was arrived at (Patton, 1990). This step involved both a description of the experience of student HFI, as well as elucidating the underlying factors that contribute to the experience. Data collection and analysis was ended after the twelfth interview, as no significant new themes were emerging and clear commonalities were apparent across the data (Creswell, 2014; Saunders et al., 2018). The first author (MB) led the coding process, with regular check-ins with the other authors, who supervised this research, to discuss coding structure and findings and to determine when data collection could cease.

The first author, who conducted the interviews, occupied the space as both "insider" and "outsider" on this project, which has been referred to as "the space between" (Dwyer & Buckle, 2009). At the time of conducting this research, the interviewer was an undergraduate student in NS, sharing that commonality with the participants, however she was not a student who experienced food insecurity. There was a sense during the interviews that participants looked to the interviewer as a peer, however, and seemed honest and open during the interviews. This may not have been the case had the interviewer been a faculty member.

Results

Demographic characteristics

The majority of students were considered moderately food insecure (n = 10), with two participants being severely food insecure. Nine of twelve participants were single, two were common-law, and one was married. Two of twelve participants had children. Seven participants were students at Mount Saint Vincent University (MSVU), two were students at Dalhousie University, two were students at Acadia University, and one was a student at Nova Scotia College of Art and Design (NSCAD); MSVU, Dalhousie, and NSCAD are located in Halifax, NS, while Acadia is located rurally in Wolfville, NS. Two students were international students, while the remaining ten were Canadian citizens. Students varied from first to fifth year in their program, and were enrolled in a wide range of programs, from business administration, to sociology, to jewelry and metalsmithing.

Student experience of HFI

While Radimer's four dimensions of HFI were evident in the data, multiple other aspects of the experience of student HFI arose out of the interviews, including emotions relating to their experience and the physical and academic impacts of HFI.

Quantitative

This aspect of HFI often presented as skipping meals, going hungry during the day, or reducing portion sizes to make the food they had last longer. For example, Jennifer noted that:

> I feel like if I can make something stretch, whether it be like a loaf of bread, and I'll make half a sandwich versus a full sandwich to make it, stretch whatever I have, rather than go to a food bank and take away from somebody else.

Karen described eating smaller portions, such as a granola bar for breakfast and a piece of fruit for lunch, with a full meal at dinner, but felt that she was eating enough because she was not going to bed hungry. Olivia mentioned that when money was tight, she would not eat lunch and would eat less food overall.

Qualitative

More commonly described than quantitative experiences of HFI were qualitative experiences. All students made note of not eating the foods they wanted to, or of eating foods they knew were not "healthy" because it was all they could afford. Nicole noted: "I feel like I'm always making sure that I'm fed, maybe not always as much as I want to be, but what generally will get sacrificed I guess is like the nutritional aspect of the food."

Students described purchasing larger quantities of cheaper foods such as Minute Rice, pasta, and canned food, especially when they were on sale. Amanda stated that she and her family often eat less healthy options, just because they have to, not because they want to. Charlotte mentioned that because she could not afford to pay full price on many food items, she would have to buy produce that was wilted or going bad.

Psychological

Two common themes arose out of the data in relation to this dimension: lack of choice and preoccupation with their household food supply.

Lack of choice

Several students described feeling a lack of choice over what and how much they could eat, which limited the variety of their diet. Amanda explained that her daughter would often get tired of eating the same things. Henry shared that he would often get similar foods from the food bank, such as sweet potatoes, onions, and frozen meats, but he has found ways to diversify what he eats, such as by trading foods. Relatedly, students described almost a yearning for foods they

used to be able to eat or afford, such as tuna, berries, smoothies, and Parmesan cheese. Olivia said "buying almonds should not be a luxury" but that foods like that were off limits given her financial constraints.

Preoccupation with the food supply

This involved constant thinking about where food and/or money for food will come from and planning when and how food will be acquired and prepared. Students planned their budget meticulously and/or checked prices at stores constantly to ensure their money would last. Along with this preoccupation came a feeling of anxiety and insecurity about obtaining food, planning meals, and eating the "right things." Olivia noted:

> I don't know what it would feel like to go to the grocery store and not add everything up before I get to the till, so that way like, I just, I can't just put things in the cart and not worry.

Social

Many participants reported having to acquire food or money in ways they would prefer not to. For example, Henry recalled eating at a restaurant and not paying, because he was hungry and had no money to buy food. He did go back and pay later, because, as he described, he has "a conscience." Many participants also explained that they had to rely on their parents more than they would like. Heather, Jiao, and Jennifer said that they prefer not to ask their parents for money, but due to limited funds, parents sometimes were needed to fill gaps in their income. Beyond Radimer's social dimensions, students also described negative impacts on their social life. For example, Jennifer explained that:

> …you're even insecure about going out with your friends, because like all your friends are going out and you don't want to be that one person who doesn't go out but they want to go to a restaurant, and then suddenly you have to figure out where that money comes from to cover it and stuff like that.

Other Dimensions

"People have it worse off than me." Many students vocalized feeling that others are worse off than them. Jennifer noted that:

> I don't want to like go to Feed Nova Scotia or to a food bank, and look only out for myself, kind of thing, when I know, like, there's single parent families that are struggling, or like families, or like even just a single person that's also struggling. That I'm going to take away from them, 'cause like no one is supporting the food banks like they used to.

Heather said that her situation is "not as extreme as other people, which I'm very fortunate for, but I definitely do feel hungry sometimes." Melissa shared that other people do not have the resources available to them that she has, and that she "…literally think[s] [the campus food bank]'s for students where they're piss poor broke, like I wouldn't even go in there. And I'm piss poor broke." Charlotte noted that she knows her situation is better than many other students who sometimes have to go hungry, while for her, she is primarily compromising the quality of her diet but getting adequate amounts of food.

Wanting to be independent from parents

Several students described the desire to be financially independent from their parents. Often, however, they had to rely on their parents, due to limited financial resources, and this caused internal tension. Nicole shared that because she is a mature student and she made the decision to return to school, "…it doesn't seem like even an option to be like going to my parents at all. I'm almost an adult now!" Melissa was no longer able to rely on her parents for support, and feels like she has exhausted all her resources and said: "I'm just like hey, you're on your own, your loan comes in next week, budget it out. This is what you have to do, you're an adult."

Emotions

Students described a range of emotions in relation to their experience of food insecurity, including shame, embarrassment, sadness, self-blame, anger, frustration, and jealousy. As an example, Olivia explained that:

> I can't talk to people about not having money, 'cause I'm embarrassed. So like, I don't know, I just make up excuses, like I need to go home and put [her son] to bed, or like, I don't have anyone to watch him tonight, but like, sometimes I do, I just, I can't tell people that because I don't want them to feel sorry for me.

Physical and academic impacts of HFI

Karen described feeling "crappy" and drained, due to the low quality of her diet. Jiao explained that she was often "so tired" and had no energy to eat. She also said that she sometimes felt sick, due to eating "too much" canned food, when she was used to eating "a lot" of fresh food before she started school. Four participants indicated weight change (loss or gain), which they related to their limited access to food. Additionally, multiple participants discussed how HFI had negative impacts on their academic performance. Karen explained that sometimes she had to skip class because she was so tired, and she also had to drop a class in order to free up some money to pay for food and other living expenses. Ahmed said that he would sometimes do his assignments

while he waited for his work shift, but "…working has caused him to lose marks." He also noted that when he does not have enough food, he "…can't do very well in studying, to be honest."

Coping mechanisms

Students made use of a variety of coping mechanisms to try and have enough food to eat. However, the majority of students did not feel that using these coping mechanisms enabled them to eat in a way that they wanted or needed to. Common coping mechanisms included buying in bulk, budgeting and watching flyers/sales, using the campus food bank and other university services, borrowing food or money from family or friends, and eating free food at work or at events. For example, Melissa said, "…if I was like literally desperate and couldn't eat, like I would ask my friends, like my friends are all students, we've all [been in a similar situation before], yeah," suggesting that many other students can empathize with the situation she was in. Four of 12 students utilized either a campus or community food bank. Henry acquired 90-95% of his food through a "fresh food bank" at a community organization. Less commonly mentioned coping mechanisms were using credit cards to buy food, picking up additional work, sharing cost of food with roommates, delaying eating or not eating, going to bed to avoid hunger, and drinking water in order to feel fuller.

Barriers

The most discussed barrier to food security was lack of money. Many factors contributed to this: inadequate or unexpectedly low student loans; high food cost, both in grocery stores and on campus; high costs of living, tuition and school-related materials; and tenuous and inconsistent employment. Some of these factors can be considered "income shocks," as will be discussed below. Multiple students mentioned having been or being in significant credit card debt or having "maxed out" lines of credit, impacting their ability to afford food. For some students, they had accumulated credit card debt before beginning school, but for many, this debt had been accrued since beginning their schooling. Amanda recounted that she pays the power and daycare bill and buys groceries before she pays her cell phone bill, "because on the pyramid of things that are important, it's the least important." While tuition cost was not specifically mentioned by many participants, those who did mention it felt that tuition was already too costly for many students and upcoming increases to tuition in NS would make it that much more difficult for students who are, as Laura stated, "just trying to get by already." Charlotte had a job on campus which was paid via honorarium, and she was only paid at the end of each semester – this made it increasingly difficult for her to afford groceries as the semester went on.

Most students also explained that lack of time was a barrier to food access, as it limited not only students' ability to grocery shop, but also to prepare and eat food. Nicole shared "mostly

it's time for me… trying to manage to have the time to either like obtain the foods, so that's going to the grocery store, but then also, like cooking the foods properly." Amanda stated "I'm always on the go, I have lots of kids and my husband, and I work full time and do school full time, so I'm just always like, yeah I'm taking the fastest thing as possible." Other students, including Jennifer and Ahmed, echoed this and explained that their busy schedule, between work and school, limited their opportunities to eat.

Other less frequently mentioned barriers were transportation, lack of familiarity with stores in the area, limited options (especially for those students living in rural areas), inadequate resources or information about resources (e.g., food banks), not feeling welcome at the campus food bank, lack of food skills or access to ingredients, poor physical or mental health, alcohol and drug addictions, poor access to culturally appropriate foods, and not having family to rely on for support.

Facilitators

Students made note of various factors in their lives that facilitated their access to food and helped them eat better, albeit still experiencing HFI. Those students who had access to a car felt that it enabled their access to food, allowing them to travel to multiple stores to obtain the best prices. Several students identified support from friends, family, or a partner as a facilitator of food access. Some students explained that their parents helped them out financially, would buy groceries when they came to visit, or helped them obtain loan funding. Ahmed and Laura also shared cooking with their roommate, which they identified as a facilitator. Additionally, Ahmed indicated that having support from his community of friends was a facilitator: "I would say that community between me and my friends is very good. So, I would go and visit [my friend], to have that meal maybe. And he will do the same if he was having the same problem."

Several students identified having food skills or preparing meals in advance as a facilitator for their food access. It is important to note, however, that other students stated that while they are knowledgeable about preparing food and what a nutritious diet entails, they simply could not eat that way due to limited finances. Some students characterized themselves as being resourceful with the food they had and making good use out of a limited food supply. For example, Henry said that the tomatoes he gets from the food bank are often soft, but he will freeze them and utilize them in sauces or curries. He also had access to many spices at home, had extensive food preparation skills, and did his own sprouting.

Additionally, those students who utilized a food bank identified it as a facilitator to their food access. It is important to note here, however, that many of the students who did not use the food bank felt unwelcome or uncomfortable about using the service or felt they did not have adequate information about this service. Jiao and Heather also explained that prior to utilizing the food bank, they had felt uncomfortable or embarrassed about going there. Once they started

using it, their comfort level increased. Nicole mentioned that sometimes her campus food bank had vegetables that she would never think to buy in store, so it has introduced her to new foods and diversified her diet. She also noted that the food bank is open 24 hours a day, which can be very useful when students are on campus late at night. Heather explained that the food bank on her campus often had fresh vegetables available that would give her the "nutritional balance" she feels she is lacking in her diet. Henry used a "fresh food bank" through a community organization he is part of; he identified the food bank at his university as "pretty grimy," suggesting his experience may be different if that was the only food bank he had access to.

Other less frequently mentioned facilitators were government financial support programs, access to a food market on campus, internet resources about eating on a budget, paid co-operative education, growing and hunting their own food, finding food on sale and/or access to more affordable stores, and living closer to a grocery store.

Proposed solutions

Students were asked about potential policy solutions to this issue; with most students, the interviewer suggested options (e.g., policy change in terms of student loans, a meal service program) and gathered their feedback on a number of ideas, as most participants needed some prompting in order to respond to this question. The three suggestions that resonated with students the most were a free campus meal program and/or improved campus food service, restructured student funding, and more accessible, welcoming food banks. Dalhousie University, in Halifax, NS, has a program that is operated at the student union called the Loaded Ladle (Loaded Ladle, n.d.), that serves free, plant-based meals multiple times a week to students. Henry and Laura, who were students at Dalhousie, felt that this program was a great offering, and Henry felt it should be part of the student union's role to provide food to students. Nicole, Charlotte, and Jennifer all felt that their campuses would benefit from a program such as the Loaded Ladle when this was described to them. Additionally, students felt that campus food service should be more accessible, in terms of hours of operation, and affordability for students.

In terms of government funding, many students suggested that it needs to be restructured to more realistically account for the cost of living for students. For example, Henry and Laura both mentioned that perhaps a non-repayable bursary should be given to specifically cover the cost of food. Heather shared that scholarships and student loans should not necessarily be based on your parents' financial situation. She said:

> most times, like a lot of my friends, our parents aren't paying for our tuition, so it doesn't really matter what our parents are making because we're the ones that are coming up with the money. So, our financial need would be our income, not my parents', because my parents might not have that extra money.

Jiao and Melissa suggested that their campus food bank be relocated to a more accessible area. Jiao also suggested to have signage in multiple languages to make it more accessible for international students on campus. Other suggestions students made were to change the language used, as they felt "food bank" had too much associated stigma, and to increase the hours to be more accessible to students with busy schedules.

Other proposed solutions were lower tuition fees, lower food costs in grocery stores or more discounts for students, a partnership between grocery stores and campus food banks, a Facebook group to share news about "good deals," and a mentorship program where new or international students can receive advice from more experienced students.

Lessons learned

Eight of twelve participants explained that they learned budgeting skills from their experiences of having difficulty accessing food. Amanda said that this is a skill that will continue to benefit her later in life. Many also noted that they did not realize the cost of food before coming to university, and they were now more knowledgeable about food prices. Many students mentioned that they had acquired food preparation skills and had learned to become resourceful and to look after themselves. Olivia shared that she has grown to feel more grateful for the things that she has, and Charlotte explained that she learned to not take money for granted.

Discussion

The current findings show that the experience of HFI among university students involves all four dimensions of Radimer's model and suggest that HFI among university students in NS is a complex issue, with many contributing factors and consequences. The commonalities among the existing Canadian qualitative research on this topic suggest that while the dynamics due to the provincial context differs, there are common threads that underlie the experience of HFI among students, at least in Ontario, Alberta, and NS (Maynard et al., 2018; Nugent, 2011). The experience among students appears to be one that is consistent with the experience of HFI among other low-income populations, including women, and specifically lone senior women (Hamelin et al., 2002; Williams et al., 2012; Green-Lapierre et al., 2012). However, unique aspects of the student experience also emerged, some of which were consistent with previous research (e.g., Maynard et al., 2018; Nugent, 2011; Silverthorn, 2016). Specifically, students experienced tension about being financially dependent on their parents, while desiring to be independent. This speaks to this time in life as a period of transition, where young adults are wanting to distance themselves from their parents at the same time that they are partially financially dependent on them. Students are also in a unique financial situation, in that many of them rely significantly on student loan payments, which are received in a lump sum at the beginning of one

or both semesters. This is in contrast to other populations, who receive monthly income from work or government transfers. This method of dispersing payments may place students at increased risk of financial precarity and HFI.

This study found that, while participants identified many factors that contribute to student HFI, the most common was precarious and inadequate finances. Previously conducted qualitative research on this topic in Ontario and Alberta also identified finances as the major barrier to food access among students (Maynard et al., 2018; Nugent, 2011). This also echoes the results reported by Meal Exchange that identified financial factors as the major barrier to food security at five Canadian university campuses (Silverthorn, 2016). In the current study, budgeting and managing money was a major coping mechanism utilized by the majority of students, as was the case in qualitative research in other Canadian provinces (Maynard et al., 2018; Nugent, 2011) The theme of desiring financial independence was also consistent with other existing qualitative research, as was the coping mechanism of needing to borrow money from friends or family in the face of this desire (Maynard et al., 2018; Nugent, 2011).

In the current study, "income shocks" were present, primarily in the form of late student loan payments, student loan payments that were lower than expected, or less work hours than expected. These income shocks likely combined with existing low levels of financial resources, to create situations in which it was very difficult for students to afford food, as students did not have the resources to cope with these income shocks. The lump sum payments of student loans may also contribute to this vulnerability. This finding is consistent with previous research in Ontario (Maynard et al., 2018). Common income shocks included student loan payments coming in late, unplanned medical expenses, or the loss of a part-time job (Maynard et al., 2018). Income shocks have also been studied in other populations. Leete and Bania (2010) studied data from the Survey of Income and Program Preparation in the US and found that both level of income and negative income shocks were predictive of food insufficiency.

In addition, the idea that others are worse off than them is a common thread between the current research and previous qualitative research. Non-campus food bank users in Ontario explained that they did not feel like the "type" of person who should access a food bank, and students in Alberta were concerned with utilizing a service that they felt other people needed more (Maynard et al., 2018; Nugent, 2011). This feeling may impact students' willingness to access services like the food bank, as they feel that their situation is better than many other people in need. It is possible that this perception comes from the normalization of student HFI in our culture, as well as the perception that many university students are "rich kids" (Meal Exchange, n.d.; Maynard et al., 2018). If students are socialized to believe that it is normal to eat poorly and struggle while attending university, and that they are privileged to be in the position they are, it is logical that they would believe that other people, such as lone mothers or unemployed people, are having a harder time than them. Students who come from families with incomes of less than $50,000 are also less likely to enroll in university than students from families with higher incomes (Statistics Canada, 2011). Therefore, it can be theorized that many university students have not experienced financial struggle prior to attending university, making

them less likely to perceive themselves as poor. They may feel services such as food banks are for "poor people", which they may not identify with. While this warrants further study, more education may be needed to debunk the myth that HFI is a normal part of the student experience, a perception that both students and the public may hold.

While previous qualitative research in this area did not specifically explore facilitators or enablers to food access among students (Maynard et al., 2018; Nugent, 2011), this study identified increasing food skills and knowledge, seeking support from friends and family, and visiting food banks as facilitators to food access, making this a unique contribution of the current study. The role of friends and family was also found to be a facilitator of food access among lone senior women and women experiencing HFI in NS (e.g., Green-LaPierre et al., 2012; Williams et al., 2012), again suggesting that there are similarities between the experience of students and other populations experiencing HFI. Additionally, it is not clear if this is an experience that is more common in rural areas, such as in NS; this is an area where further research is necessary. Previous research has found that low-income women in NS considered food banks to play an important role in meeting emergency food needs, although they failed to meet their food needs in both quantity and quality (Williams et al., 2012). The students in this study similarly expressed that food banks were important for emergencies, however, compared to the experiences of low-income women, food banks allowed the students to eat healthier than they would have otherwise because of the fresh vegetables and fruits they received (Williams et al., 2012). This raises the question of whether campus food banks and community food banks differ in terms of the quality of foods they provide or whether students perceive the food bank in a different way than do other populations.

Universities in NS and across Canada should be concerned about HFI in their student populations, as it is an issue that has the potential to impact the physical and mental health, quality of life, and productivity and retention of their students (e.g., Entz et al., 2017; Frank, 2018). Institutions of higher education support the wellness of their students through student services. However, while student-run initiatives have been created to address the food needs that arise while at university due to financial constraint, neither institutions nor governments have addressed the structural causes of student HFI. Governments have decreased post-secondary funding over time, leading to tuition increases in order to maintain the financial sustainability of NS universities (Students Nova Scotia, 2013). Increases in tuition, increased cost of living, a consistently low minimum wage, and inadequate student loans all have the potential to further exacerbate HFI among university students in our province (e.g., Newell et al., 2014; Statistics Canada, 2016). There is a significant mismatch between the cost of education and student's ability to pay, which, as this research demonstrates, impacts students' ability to purchase and eat nutritious food with significant implications for health. Why this mismatch exists is complicated and is likely outside of the scope of this specific paper, but is an important area for future research and policy considerations.

Study limitations

This study is the first to investigate student HFI in NS using a qualitative research approach, making an important contribution to the growing body of research on this topic. However, not all campus communities were included in this study. The majority of participants lived in Halifax, the urban centre of the province, meaning that the experiences of students living in more rural areas may not have been fully reflected in this study. Additionally, only undergraduate students were interviewed for this study; future research could investigate the experiences of graduate students, as it may be substantively different from that of undergraduates.

Conclusions

In the context of increasing tuition fees in NS and in combination with data on the prevalence of student HFI across Canada, the current findings are concerning. University students are already struggling to afford food and the situation may worsen, as expenses increase and food prices are forecasted to continue to increase (Dalhousie University and University of Guelph, 2019). The findings of this study suggest that relying on campus food banks to address the problem of student HFI is inadequate. Many factors contribute to HFI among university students, but precarious and inadequate finances were identified as the main contributing factor. Therefore, policies aimed at improving student funding and reducing the cost of higher education to address this issue should be a focus, so university students in Canada do not have to starve to be a student. As Dachner and Tarasuk (2018) note, tackling HFI is an essential goal of a national food policy for Canada. Addressing HFI among post-secondary students must be considered a key part of this goal. Additionally, it is important that there is a system in place to monitor and track student HFI over time, in order to ensure that policy changes are having meaningful impacts on the lives of students.

This study is an important step towards a better understanding of the experience of HFI among university students in NS and suggests that students are under unique financial and personal pressures. Potential areas for future research include exploring HFI among graduate students and early career professionals, and to explore specific policy levers, such as alternative student funding structures like educational grants or affordable food service models that could be utilized to improve student HFI in NS and Canada.

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Original Research Article

Obscuring the veil: Food advertising as public pedagogy

Ellyse Winter[a*]

[a] University of Toronto

Abstract

Working with Karl Marx's concept of commodity fetishism, the purpose of this paper is to argue that food advertisements and packaging work to further obfuscate the social, economic, and environmental relations behind the animal products and by-products consumed in Canada and the United States. The paper discusses the socio-ecological implications of the animal-industrial complex and employs a critical discourse analysis to examine how advertisements for animal products and by-products function as sites of public pedagogy to obscure these adverse effects. Finally, this paper outlines a vision of critical food pedagogies that both 'removes the veil' (Hudson & Hudson, 2003) and addresses the underlying generative framework that drives our relationship with an industrial food system.

Keywords: Commodity fetishism; advertising; animal-industrial complex; public pedagogy; critical food pedagogies

*Corresponding author: ellyse.winter@mail.utoronto.ca
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Introduction

The landscape of animal agriculture has changed drastically and is now dominated by a largely corporate and industrialized model (Gunderson, 2011; MacDonald & McBridge, 2009; Rossi & Garner, 2014). Although this model has given the illusion of producing a large volume of inexpensive animal products and by-products, it has done so with significant burden to the environment and to the well-being of both humans and animals (Gunderson & Stuart, 2014; MacDonald & McBridge, 2009; Rossi & Garner, 2014). Further, one of the implications associated with a growing and consistent food surplus, largely made possible through an industrial food system, is that fewer people need to be involved in the production of food (Albritton, 2012). Consequently, the industrial food system is premised on a profoundly different relationship with animals and the earth and both a spatial and conceptual distance between the producers and consumers of food (Kneen, 1993; Knezevic, 2012; Weis, 2012). A consequence of this distance is that the socio-ecological implications of industrial animal agriculture are largely hidden from popular consciousness and obscured by market imperatives, leaving consumers with limited knowledge about precisely what is involved in the food products they purchase and consume (Gross, 2012; Knezevic, 2012; Weis, 2012). While not speaking explicitly about an industrial food system, Marx (1990) referred to this general phenomenon as commodity fetishism, whereby the relations and costs involved in the production of commodities are minimized and difficult to comprehend. Commodity fetishism is prevalent in a capitalist system, whereby a consumer's experiences with the production of commodities are limited to the characteristics of the final product itself, such as price, convenience, quantity, and packaging (Hudson & Hudson, 2003; Marx, 1990; Sage, 2011).

With this context in mind, the purpose of this paper is to argue that food advertisements and packaging add "additional layers of meaning on to commodities" (Hudson & Hudson, 2003, p. 427) and in doing so, work to even further obfuscate the social, economic, and environmental relations behind the animal products and by-products we consume. In order to demonstrate this argument, I will begin by discussing the implications of industrialized animal agriculture for animals, the earth, and humans. I will then discuss how advertisements for animal products function as sites of public pedagogy. Using the methodological field of critical discourse analysis, I will demonstrate how such advertisements further obscure the adverse effects of industrial animal agriculture. Lastly, I will emphasize a vision of critical food pedagogies that work to not only "remove the veil" (Hudson & Hudson, 2003, p. 427) to reveal the socio-ecological implications of industrial animal agriculture, but to also address the underlying generative framework that drives consumers' relationship with food.

The implications of the animal-industrial complex

Bound to the overarching structure of capitalism, industrial animal agriculture has resulted in adverse effects for animals, the environment, and humans. Within the context of this paper, I will refer to this current model of producing animal products and by-products as the animal-industrial complex. Deriving from earlier concepts of the prison-industrial complex and the military-industrial complex, the animal-industrial complex refers to the largely opaque and overlapping interests of the agricultural sector, governments, agribusiness corporations, and the economy that together result in the commodification and objectification of animals (Fitzgerald & Pellow, 2014; Noske, 1997; Twine, 2012). Further, conceptualizing this model as the animal-industrial complex elucidates the ways in which animal agriculture is deeply entrenched in a capitalist logic that values profit over all else and depends on large-scale, highly technological, and depersonalized systems of production for mass consumption (Noske, 1997; Twine, 2012). As outlined by Rossi and Garner (2014), some of the definitive characteristics of this current model are corporate ownership, the merging of industries, the intensive confinement of large amounts animals, the use of growth-facilitating antibiotics, the use of remotely grown food, and extensive control over living conditions of animals in an effort to maximize efficiency and profit.

Implications for animals

In discussing the implications of industrial agriculture for animals, this paper emphasizes structural violence with a particular focus on how the forms of violence associated with breeding, growing, and killing practices are largely regulated and socio-politically legitimized (Cudworth, 2015). Although the specific methods and equipment used within systems of industrial agriculture vary among different species, a focus remains on minimizing costs and maximizing productivity and animals are thus often produced in barren and restricted environments and subject to mundane and routinized forms of violence (Kim, 2011; Mason & Finelli, 2013; Rossi & Garner, 2014). For instance, technologies of confinement such as battery cages, veal crates, gestation crates, and tethering inhibit an animal's capacity to stretch his or her legs or wings, turn around, or lie down comfortably (Kim, 2011; Mason & Finelli, 2013; Rowe, 2011). Issues of overcrowding are also present in systems that intensively house large numbers of animals and often require continuous manipulation of anatomy and physiology in order to maintain mass commodity production (Mason & Finelli, 2013). The harm inflicted on animals within spaces of industrial agriculture also stems from the ways in which animals are manipulated to live in systems that reflect human dispositions and economic modalities rather than their own natures and adaptations (Anthony, 2012; Corman & Vandrovcova, 2014; Davis, 2004/2010). Such systems ignore the fact that animals are sentient beings capable of developing profound social relationships and possess emotional lives, preferences, desires, and innate

tendencies that they would express in natural conditions (Davis, 2010; Corman & Vandrovcova, 2014; Medero, 2014).

Further, the animal-industrial complex relies on processes of reproductive manipulation to ensure continuous impregnation and the resultant production of future animal products and by-products (Cudworth, 2010; Gillespie, 2014; Rossi & Garner, 2014). For instance, dairy cows, like humans and other mammals, produce milk following pregnancy and delivery (Berreville, 2014). Consequently, to begin the process of milk production, cows are often forcibly ejaculated and impregnated using human hands, arms, and instruments (Bereville, 2014; Cudworth, 2015; Gillespie, 2014). Moreover, in order to speed up reproductive cycles, and to prevent calves from ingesting any of the milk intended for them that can instead be sold for human consumption, babies are often prematurely separated from their mothers and fed milk replacer or waste whole milk (Bereville, 2014; Mason & Finelli, 2013). Although industry-based and anecdotal evidence point to the negative impact that prematurely removing a calf from his or her mother can have, it is considered best practice - code for most profitable - to remove the calf shortly after birth (Bereville, 2014). This psychological violence caused by separation is therefore an inherent product of an industrial system, wherein the demands of uninterrupted milk production results in an endless cycle of insemination, pregnancy, calving, calf removal, and lactation for cows (Bereville, 2014).

Lastly, animals' lifespans are cut drastically short within systems of industrial agriculture in an effort to increase turnover time (Weis, 2013). For instance, cattle can now reach commercial slaughter weight in eighteen months, pigs in as few as six months, and broiler chickens in only six weeks (Weis, 2013). As this time approaches, animals may be shipped long distances to slaughter without food or water, are frequently exposed to extremes of heat and cold during transport, and experience overcrowding, making them subject to suffocation and crushing (Cudworth, 2015; Rossi & Garner, 2014; Rowe, 2011). According to a recent article published by CTV National News, Canada's livestock transportation rules are the worst in the Western world, allowing for pigs, chickens, and cattle to be transported for between 36 and 52 hours without access to food or water and without minimum or maximum temperature regulations to protect the animals from harsh winters or extreme heat (Schulman, 2016). As a result, the Canadian Food Inspection Agency highlights that between two and three million animals die during transport every year (Schulman, 2016). Further, animals are often handled roughly during transport, particularly during the stages of loading and unloading where they may be corralled using electric prods (Rossi & Garner, 2014). Moreover, given the expected line speeds within industrial slaughterhouses that may not allow time for proper stunning, animals may be scalded, skinned, or dismembered while partly or fully conscious (Rossi & Garner, 2014).

Implications for the environment

It is widely accepted that anthropogenic factors pose a considerable threat to the earth's ecology and systems (Magdoff & Foster, 2010). One particular human activity that exerts a substantial

impact on the environment is the food that we consume (Oppenlander, 2013; Sage, 2011; Weis, 2013). In particular, the rapidly growing and intensifying production of animal products and by-products yields one of the greatest environmental impacts when compared to other categories of food (Oppenlander, 2013; Sage, 2011). Livestock production is now considered to be one of the top two or three most significant contributors to some of the most serious environmental problems, including greenhouse gas emissions, water pollution and depletion, land degradation, and biodiversity loss (Food and Agricultural Organization, 2006; Reisch, Eberle, & Lorek, 2013; Weis, 2013).

First, research is beginning to document the substantial impact of animal agriculture on climate change, now considered to be one of the most serious challenges facing the human race (Food and Agricultural Organization, 2006). In examining the phenomenon of human-induced climate change, evidence suggests that animal agriculture is responsible for a larger share of greenhouse gas emissions than transport (Food and Agricultural Organization, 2006; Popp, Lotze-Campen, Bodirsky, 2010; Scarborough, P. et al., 2014). Second, in addition to reaching a maximum use of fossil fuels such as oil, many believe that 'peak water' has also been reached, due to the past and present use of freshwater as if it were a fully renewable resource and infinite in quantity (Oppenlander, 2013; Weis, 2013). In this way, along with climate change, water scarcity is likely to become one of the largest challenges the world will face (Food and Agricultural Organization, 2006; Oppenlander, 2013). The livestock sector contributes to such issues of water scarcity through immense water usage, water pollution, and inhibiting water replenishment (Food and Agricultural Organization, 2006; Ilea, 2009; MeKonnen & Hoekstra, 2012). Requiring substantially more water than plant protein, the production of animal protein is considered to be one of the most inefficient uses of water and the largest use of water as a single food product (Oppenlander, 2013; Pimentel & Pimentel, 2003; Weis, 2013). Third, the production of animal products and by-products also contributes a significant amount of waste to the environment, including manure, carcasses, excess feed, and feathers (Sorenson, 2010; Walker et al., 2005). Finally, animal agriculture is the single largest anthropogenic use of land, contributes to significant deforestation as forests are cleared to make room for grazing animals and to plant feed crops, and consumes more than a third of the world's grain harvest (Food and Agricultural Organization, 2006; Ilea, 2009; Weis, 2013).

Implications for humans

The production of animal products and by-products within the animal-industrial complex also has immense implications for humans and communities. Although the meat, egg, and dairy industries are largely flourishing within the United States and Canada, the workers in the processing line do not share in this fortune (Oxfam, 2016). Employees of the animal-industrial complex, particularly within slaughterhouses, face one of the highest risk jobs in the United

States (Glasser, 2011; Oxfam, 2016; Wrenn, 2015). In 2005, the Human Rights Watch identified slaughterhouses as the most dangerous factory job, with an injury rate five times higher than the national average (Glasser, 2011; Nibert, 2014; Oxfam, 2016). Employees also endure long hours in difficult conditions and are at an increased risk of developing respiratory disease, hearing loss, musculoskeletal problems, and contracting zoonotic diseases or antimicrobial resistant bacteria (Dillard, 2008; Oxfam, 2016; Walker et al., 2005). A recent report from Oxfam (2016) draws particular attention to the deplorable working conditions experienced by slaughterhouse line workers, some of whom have come to be afraid to ask for permission to use the bathroom and have thus soiled themselves, taken steps to reduce their intake of fluids, held urinary and bowel functions for as long as possible, and worn diapers to work. Further, employees have little to no job security or voice in opposing unsafe working conditions and earn disparately low wages (Oxfam, 2016).

Additionally, research is beginning to address the psychological effects of working in a slaughterhouse and the trauma associated with being responsible for killing countless animals, observing animals being cut and dismembered while still conscious, and interacting with animals in various states of fear and pain (Dillard, 2008; Rowe, 2011; Weis, 2013). Given the increasingly rapid pace of slaughter that persists in an effort to maximize productivity, employees are expected to consistently kill animals using violent methods, causing lasting psychological implications (Dillard, 2008; Nibert, 2014; Oxfam, 2016; Rowe, 2011). To this effect, one slaughterhouse worker comments:

> The worst thing, worse than the physical danger, is the emotional toll…pigs down on the kill floor have come up and nuzzled me like a puppy. Two minutes later I had to kill them - beat them to death with a pipe. I can't care (Dillard, 2008, p. 391).

Food advertising as public pedagogy

As industrial animal agriculture has intensified and consequent criticisms have insisted the practice is inhumane and both socially and environmentally destructive, "an assortment of corporate strategies have ensured that construct an image of a benevolently beneficial industry" (Glenn, 2004, p. 64). Consequently, a consumer's interaction with animal products and by-products in countries like Canada and the United States is shaped by obscure market forces (Weis, 2012). The focus within the context of this paper is the use of advertisements as a particular corporate strategy to obscure the aforementioned implications of the animal-industrial complex. With over 40 billion dollars spent on food marketing, society is inundated with food advertisements on television, billboards, computer screens, bus shelters, and on food packaging (Roberts, 2013). As such, I argue that food advertisements for animal products function as sites of public pedagogy.

Although the term pedagogy has traditionally referred to the theory, principles, and practice of teaching within elementary, secondary, and postsecondary classrooms, the 'pedagogical turn' has expanded the definition of pedagogy to include the spaces and sites of teaching and learning outside the system of formal education (Flowers & Swan, 2012; Giroux, 2011; Sandlin, Schultz, & Burdick, 2009). In this way, we are constantly involved in processes of teaching, learning, unlearning, and relearning as educational activity is engaged in by not only professional teachers or academics, but also by journalists, activists, photographers, artists, film directors, musicians, writers, bloggers, etc. (Flowers & Swan, 2012; Mayo, 2014; Sandlin, Schultz, & Burdick, 2009). Such spaces are important in that they reflect a more democratized access to knowledge than is possible via formal education (Harper, 2010; Sandlin, Schultz, & Burdick, 2009). Consequently, given that less than 2% of the U.S. population is involved in the production of food (USDA, 2009, as cited in Specht & Buck, 2014), advertisements come to exploit an educational gap between the producer and consumer. In this way, such advertisements function as a contemporary process of teaching society about food (Flowers & Swan, 2012). Within the context of this paper, the central question then becomes, as tools of public pedagogy, what specifically are advertisements for animal products teaching us?

Methodology

Working within the context of the aforementioned body of literature, this project is grounded in a concern with the ways in which advertisements for animal products and by-products function as sites of public pedagogy to obscure the socio-ecological implications of the animal-industrial complex. In order to explore this particular problem, this paper utilizes a qualitative critical discourse analysis of 11 advertisements for meat, eggs, and dairy products. In this context, the term discourse is used to refer to the particular ways of conceptualizing a phenomenon that are circulated throughout society and reproduced in aspects of our daily life (Koc, Sumner, & Winson, 2012). Within this particular paper, I am interested in the discourses circulated regarding the animal-industrial complex via food advertisements. I will begin by discussing the theoretical and methodological underpinnings of critical discourse analysis. From there, I will outline the rationale for the chosen methodology, the research context, the data sources, and the data collection and analysis methods.

To begin, critical discourse analysis is understood as both theory and method (Fairclough, 2001; Rogers, 2011). First, critical discourse analysis considers current social relations as bound to a particular socio-historical context and as shaped by particular constructions or versions of reality (Locke, 2004; Wodak, 2001). In this sense, all discourses are historically produced and interpreted and can only be understood in relation to their social context (Meyer, 2001; Wodak, 2001). Second, within critical discourse analysis, power is understood as a central concept and force driving social relations (Jager, 2001; Rogers, 2011). Moreover, power is understood not as

necessarily maintained through overt force as much as resulting from discourses that privilege some individuals or epistemologies over others (Jager, 2001; Locke, 2004). In this sense, critical discourse analysis involves exposing the ways in which dominant discourses in society reinforce existing power inequities (Jager, 2001; Wodak, 2001; Wodak & Meyer, 2009). Considering critical discourse as a method for collecting and analyzing data, critical discourse analysis examines the social context that produced a particular text and the processes through which individuals and groups create meaning as they interact with texts (Fairclough, 2010; Wodak, 2001). More specifically, critical discourse analysis posits these texts as a central part of social relations and involves a consideration of the reciprocity between these forms of meaning making and aspects of social relations such as social identities, values, and means of production (Fairclough, 2001). In this way, critical discourse analysis considers the ways in which power relations are reproduced, reinforced, or challenged within texts and narratives (Wodak & Meyer, 2009).

It is with this context in mind that critical discourse analysis has been chosen as a suitable methodology to be used in addressing the problem underlying this research. In keeping with critical discourse analysis's focus on "the social processes and structures which give rise to the production of a text" (Wodak, 2001, p. 3), this research considers the ways in which the landscape and resultant socio-ecological implications of the animal-industrial complex have led to the production of particular texts, in this case advertisements. Moreover, by focusing on the ways in which power relations, specifically those related to processes of commodity fetishism, are reproduced within these advertisements, this paper explicitly aligns with critical discourse analysis's assertion that "inquiry into meaning making is always also an exploration into power" (Rogers, 2011, p. 1).

In keeping with critical discourse analysis, the first thing a researcher must do is situate the investigation within one particular discourse plane or research setting (Jager, 2001). The discourse plane or research setting for this project is advertisement, more specifically, those that have been circulated within Canada or the United States and reproduced online. The data source for this paper is drawn from 11 advertisements for meat, eggs, or dairy products. 11 advertisements have been chosen in keeping with a qualitative research approach, which posits that it is best to study a few individuals or cases in order to provide an in-depth and complex picture of the central phenomena (Plano Clark & Creswell, 2010). The 11 spaces that comprise the research sample for this project have been purposefully selected. In this sense, purposeful sampling refers to the process whereby the researcher intentionally chooses information-rich sites or participants to learn about the central phenomenon under examination (Patton, 2002; Plano Clark & Creswell, 2010). Consequently, the sites have been purposefully chosen as illustrative examples based on having been recently circulated via billboards, bus shelters, or in grocery stores within the past few years. Moreover, maximal variation sampling strategies have been used in an effort to select sites that best illustrate different perspectives related to advertising for meat, eggs, and dairy and processes of commodity fetishism.

In order to analyze the data, a series of topics were established to be used in the coding process. In this context, the coding process refers to "the process of segmenting and labelling text [and images] to form descriptions and broad themes in the data" (Creswell, 2002, p. 266). These codes were defined both before and during data analysis, derived from the literature review and the data itself (Hsieh & Shannon, 2005). Overall, the purpose of this coding process is to unveil broader patterns from the collected data about the degree to which food advertisements and packaging work to further obfuscate the social, economic, and environmental relations behind the animal products and by-products consumed in Canada and the United States. Analysis is understood to be complete "when it reveals no further contents and formally new findings" (Jager, 2001, p. 17). In this way, at a certain point in the analysis process, it is projected that I will achieve saturation and there will no longer be new ideas presented on a given theme.

Results and discussion

Up to this point, I have argued that food advertisements function as sites of public pedagogy, with the potential to circulate particular understandings of the process of producing meat, eggs, and dairy products in the United States and Canada. The purpose of this section of the paper is to therefore address the particular understandings – or discourses – being circulated in this educative process. Overall, the data reveal that advertisements for meat, eggs, and dairy products in the United States and Canada reinforce the notion that food is "largely something to be bought and sold in the marketplace rather than a biological and cultural necessity (MacRae, 2012, p. 310). Moreover, as one would come to expect, advertisements "try to highlight information that can sell the product while obscuring the information that may make us question the product" (Knezevic, 2012, p. 251). As such, in the sections to follow, I will argue that these pedagogical spaces attempt to teach us that farm life is picturesque, rustic, and serene, and that live animals as individual entities are inexistent. These particular strategies, henceforth referred to as the perpetuation of the rural idyll and the absent referent, function to "sell the product" (Knezevic, 2012, p. 251) and "construct an image of a benevolently beneficial industry" (Glenn, 2004, p. 64). Inherent to the use of both of these strategies is a perpetuation of the distance between the producers and consumers of food and thus the obscuring or veiling of the social, environmental, and economic conditions involved in production. Further, these particular strategies come to provide the industrial food system with a "cloak of legitimacy" (Knezevic, 2012, p. 250) and encourage the maintenance of complacency or "distancing without major objections" (Knezevic, 2012, p. 249).

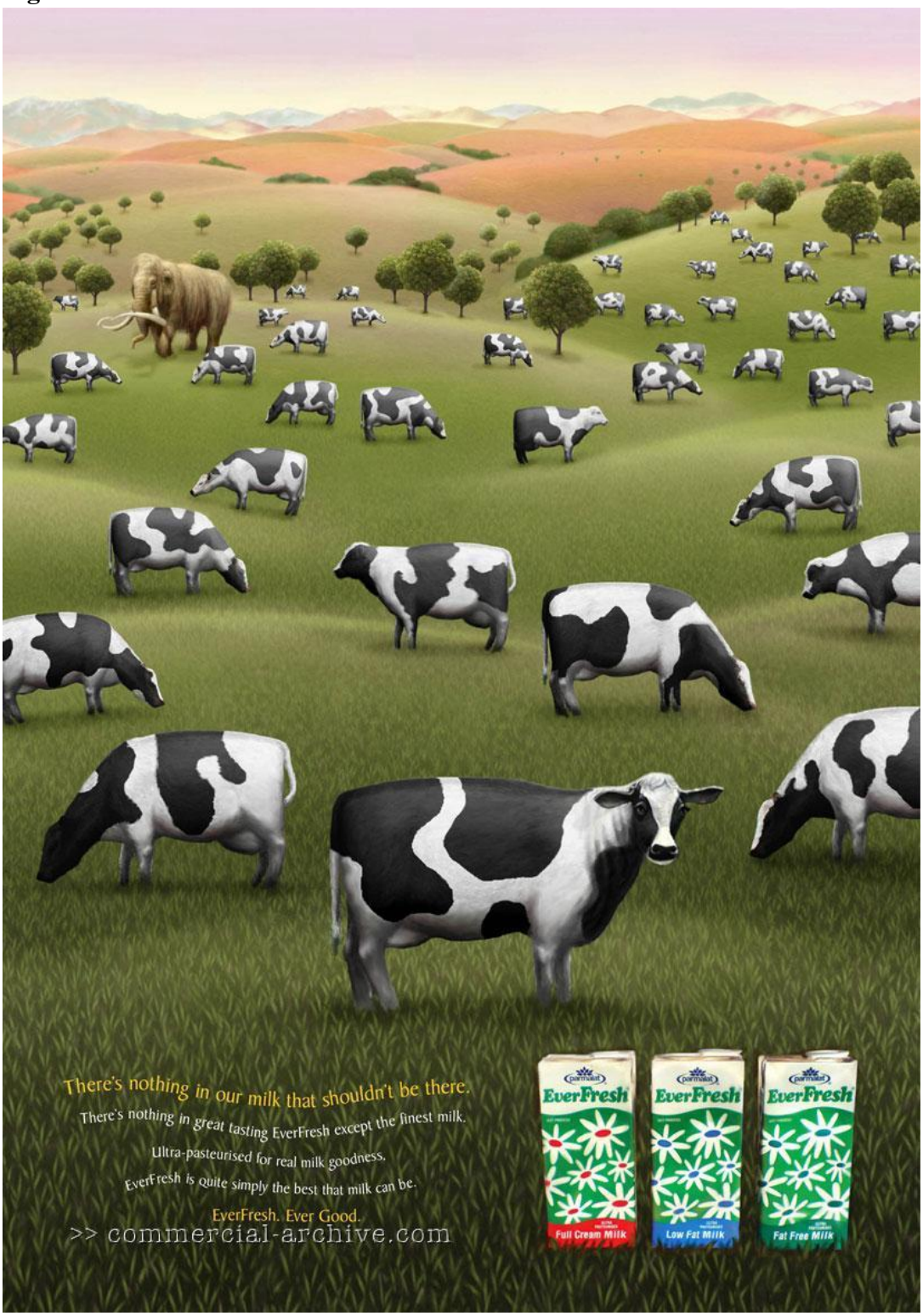
The rural idyll

The twentieth century was largely characterized by two conflicting processes – the increased intensification of animal agriculture and the romanticism of farming as a 'rural idyll' (Cudworth, 2003, Wiebe, 2012). Pedagogical spaces such as advertisements for meat, eggs, and dairy, serve an important role in romanticizing animal agriculture by circulating discourses of farm life as rustic and serene (Weibe, 2012). Mason and Finelli (2007) capture this sentiment well in saying,

> In our mind's eye the farm is a peaceful place where calves nuzzle their mothers in a shady meadow, pigs loaf in the mudhole, and chickens scratch about the barnyard. These comforting images are implanted in us by calendars, coloring books, theme parks, petting zoos, and the countrified labelling and advertising of animal products…The reality of modern farmed animal production, however, is starkly different from these scenes" (p. 158).

Figures 1 through 5 demonstrate the use of the rural idyll as a particular corporate strategy and these "comforting images" (Mason & Finelli, 2007, p. 158) in advertisements for animal products. These advertisements (see Figures 1-5) present images of rolling hills, grazing cattle, country homes, and small red barns in an attempt to circulate educative stand-ins for the reality of industrial animal agriculture. These pedagogical spaces reproduce a veil over the reality of the animal-industrial complex, wherein animals are often produced in barren and restricted environments and subject to a range of physical and psychological stressors (Mason & Finelli, 2013; Rossi & Garner, 2014), where slaughterhouse workers - a workforce comprised primarily of racialized and low income communities - face deplorable working conditions and an injury rate five times higher than the national average (Nibert, 2013; Oxfam America, 2016), and where the contribution to some of the most serious environmental problems, including greenhouse gas emissions, water pollution and depletion, land degradation, and biodiversity loss, far exceeds that of other industries (Food and Agricultural Organization, 2006; Oppenlander, 2013).

Figure 1: Advertisement for Ever Fresh Milk



Source: Plunket, Justin (2017). http://www.justinplunkett.com/illustration

Figure 2: Logo for Perdue Farms

Source: https://www.foodonline.com/doc/voluntary-class-ii-recall-issued-by-perdue-farms-0001

Figure 3: Main image on Hans Dairy website

Source: https://hansdairy.com/

Figure 4: Advertisement for California Milk

Source: https://loggersdaughterfinland.wordpress.com/2012/10/20/farm-to-fork-finnish-milk/

Figure 5 : Lactancia Milk Carton

Source: https://www.dizin.ca/p-rfiltre-2-milk-2l-lactantia/

The absent referent

Originating in the field of linguistics, the concept of the absent referent has been taken up by Carol J. Adams, among other eco-feminist writers, to describe that which separates the meat eater from the animal and the animal from the end product (1991, 2010). As such, "live animals are the absent referent in the concept of meat" and "the absent referent permits us to forget about the animals as an independent entity" (Adams, 2010, p. 204). The increasing distance between the producers and consumers of food and processes that result in commodity fetishism that are characteristic of an industrial food system amplify the phenomenon of the absent referent, as many consumers will never encounter the live animal from which the product or by-product they purchase was derived from. In this way, the killing of animals for meat, eggs, and dairy products is largely removed from the public (Cudworth, 2015). Many people are never involved in or have to bear witness to the process of killing animals for food, and simply enter a grocery store and purchase plastic-wrapped packages of skinless and boneless flesh, perhaps adorned in images of "countrified labeling" (Mason & Finelli, 2007, p. 158), never having to see the animal from which it came or think about the conditions of his or her life and death. As such, consumer experiences with the production of meat, eggs, and dairy products "is limited to the final product of labor, its quantity, and its price" (Hudson & Hudson, 2003, p. 416).

Figures 6 through 11 illustrate the structure of the absent referent present within advertisements for animal products. In these advertisements, the animal is either reduced to his or her flesh (see Figures 8 and 9), animated (see Figures 10 and 11), or in the case of Figures 6 and 7, literally missing from the advertisement with the credit for production given solely to the farmer. Each of these images, once again, veils the conditions for animals within systems of industrial agriculture and erase the sentient animal as an individual entity from the equation.

Figure 6: Advertisement for McDonalds

Source: https://www.manitobacooperator.ca/news-opinion/news/mcdonalds-rolls-out-campaign-thanking-farmers/

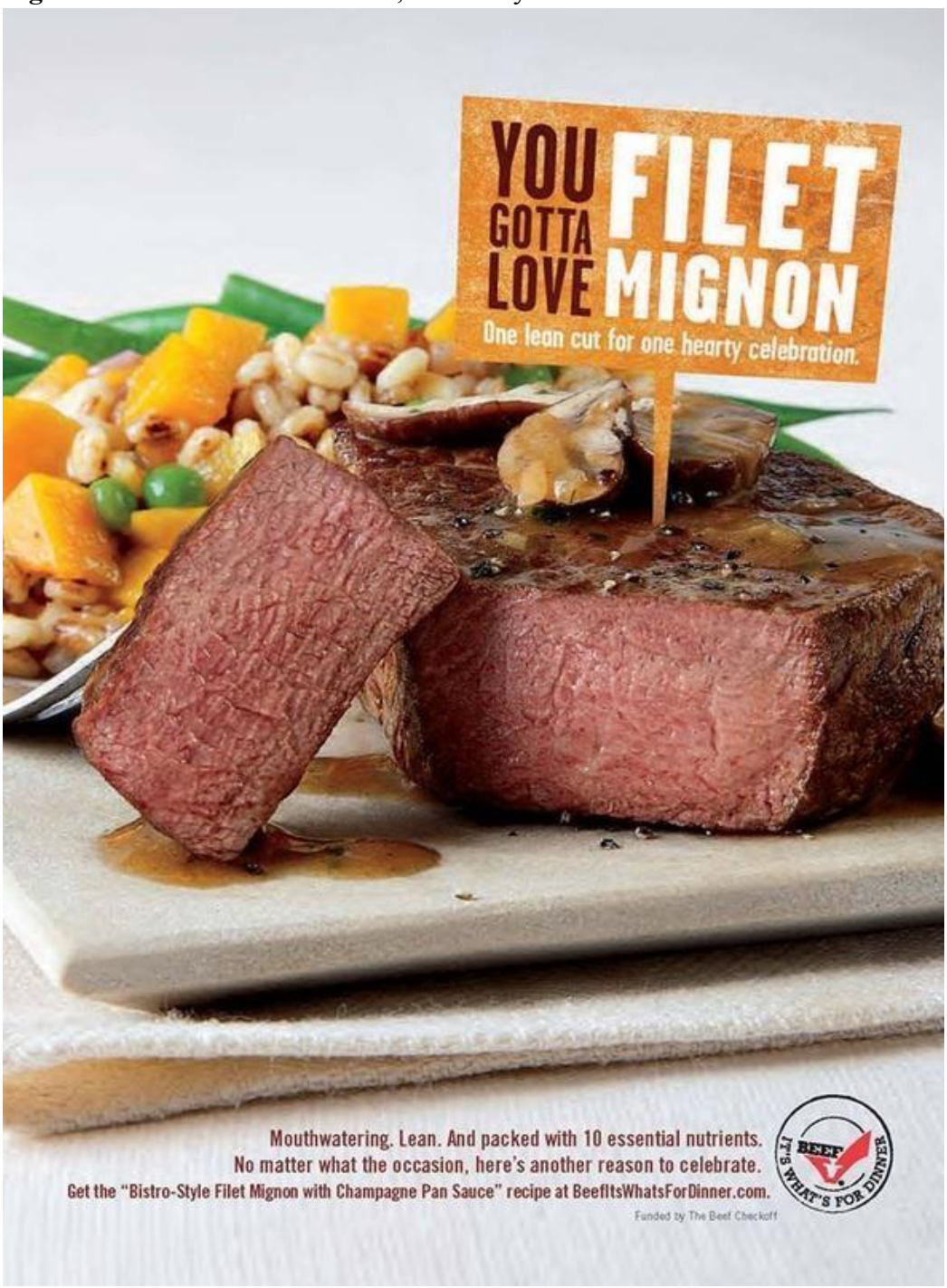
Figure 7: Advertisement for Egg Farmers of Ontario

Source: https://cargocollective.com/aaronbolyos/Egg-Farmers-of-Ontario

Figure 8: Advertisement for Kentucky Fried Chicken

Source: https://www.takefiveaday.com/2010/04/13/kfc-double-down-the-cheese-sauce-arent-fried-i-think/

Figure 9: Advertisement for Beef, funded by The Beef Checkoff



Source: https://ademarch2014-simpeixuan.weebly.com/ad-design-analysis/beef-its-whats-for-dinner

Figure 10: Packaging for The Laughing Cow Cheese

Source: https://www.thelaughingcow.com/

Figure 11: Advertisement for Natrel Chocolate Milk

Source: https://www.walmart.ca/en/ip/natrel-1-chocolate-milk-on-the-go/6000198484339

Complacency

In addition to reinforcing food as a commodity to be bought and sold and perpetuating the rural idyll and the structure of the absent referent, I also argue that these advertisements encourage complacency with the industrial food system. Understanding the relationship between food advertising and labels, Knezevic (2012) suggests,

> Food labels shape our understanding of the food we buy and consequently our understanding of the food system. They tap into what we want to hear (and read) by providing constant reassurance that the food system is under control and functioning. In the long run, they assist the industrial food system in minimizing criticism and challenges. For most consumers, who can devote only a fraction of their time to making food-purchasing decisions, they provide a sense of security and knowledge and at the same time discourage questioning of the food system. Most of all they assure us that it is acceptable to not know where our food comes from (p. 249).

In this way, the messages from food manufacturers, labels, and advertisements alike, become powerful educative tools for reinforcing the status quo of commodity fetishism and thus the obscuring of the social, environmental, and economic conditions involved in the production of food (Knezevic, 2012). Moreover, advertisements work to lull consumers into a false sense of assurance; that there is nothing truly broken or troubling about the industrial food system (Knezevic, 2012). Figures 3 and 8 are particularly relevant examples of capitalizing on the fact that many consumers "can devote only a fraction of their time to making food-purchasing decisions" (Knezevic, 2012, p. 249). Figure 3, an advertisement for Hans Dairy, boasts the tagline "We think about every ingredient so you don't have to." Similarly, Figure 8, an advertisement for Kentucky Fried Chicken's 'Double Down' includes the pseudo-word "Unthink." As such, both of these advertisements teach consumers not to think about where their food comes from and to simply trust that agribusiness corporations are doing the thinking to ensure what is best.

Implications: The role of critical food pedagogies

Knezevic (2012) argues, "because of its free-market foundations, the industrial food system is…inadequate in addressing the concerns regarding its social and environmental costs" (p. 247). It is therefore unlikely we can expect agribusiness to change in favor of a more equitable food system. Consequently, I argue that critical food pedagogies have a crucial role to play in challenging the industrial food system and producing genuine educative spaces that circulate counter-hegemonic discourses. In this sense, food pedagogies can be understood as educative

processes regarding how to engage with food in a variety of capacities, including growing, shopping for, eating, or disposal (Flowers & Swan, 2012). Critical food pedagogies then, are those not simply concerned with teaching and learning about food, but approaches that address power and injustice as related to food (Sumner, 2015).

In part, I envision the role of critical food pedagogies as "removing the veil" (Hudson & Hudson, 2003) that conceals the socio-ecological implications of the animal-industrial complex. Consequently, information must be widely accessible regarding the adverse effects of industrial animal agriculture on animal well-being, the environment, and employee rights and safety. However, critical food pedagogies that focus exclusively on merely creating awareness or greater transparency are likely to fall short of transformational change. It may seem logical to suggest that if we are unable to rely on large corporations or the government to make the right decisions regarding sustainable and equitable food systems, why can't individuals simply make those decisions for themselves? I believe the answer to this question is similar to why many individuals choose to drive an automobile rather than ride a bicycle to get from point A to point B despite information regarding the environmental degradation caused by the automobile industry – our current infrastructure in many cities is designed for transportation via automobile. Similarly, our current infrastructure is designed for the consumption of processed foods, pesticide-laden produce, and large amounts of meat, eggs, and dairy products. In this way, it is problematic to assert that those who purchase and consume foods produced via the animal-industrial complex are fundamentally less knowledgeable or ethically inclined (Guthman, 2011; Wrenn, 2015). A focus on personal culpability ignores the collective power and institutional support of the animal-industrial complex and the structural conditions – those of which are beyond the scope of this paper to address – that contribute to a reliance upon it and limit access to alternative foodways (Wrenn, 2015; Wrenn et al., 2015). As such, the notion of simply creating awareness and hoping that change will occur at an individual level largely ignores the immense power imbalances that persist within the food system and within society more generally.

I therefore argue that critical food pedagogies must go beyond simply creating awareness or greater transparency, to addressing the underlying infrastructure and generative framework that drives our relationships with an industrial food system. First, critical food pedagogies such as non-profit organizations or activist groups, protests, social media accounts, workshops, conferences, documentaries, photography, artwork, etc. can work to undermine both the animal-industrial complex and the logic of capitalism within which it is situated. Groups such as Food Not Bombs, Food Empowerment Project, Sistah Vegan Project, Vegan Hip Hop Movement, Vegan Voices of Colour, and Striving with Systems do important educative work in not only shedding light on the immense burden of the animal-industrial complex, but do so alongside a critique of capitalism and in solidarity with other social justice movements. Second, this vision of critical food pedagogies would involve disrupting the discourse of food as a commodity and instead positioning food as a human right and both a physiologically and culturally nourishing life good (Knezevic, 2012; Wiebe, 2012). In this way, critical food pedagogies would challenge

the anonymity and commodification associated with an industrial food system in favor of a community food economy that lessens the distance between producers and consumers (Gross, 2011). This would involve the creation of counter-hegemonic possibilities within the food system, such as farmers' markets, community gardens, urban agriculture, community supported agriculture, school gardens, food co-operatives, and food-based education (Barndt, 2012).

Conclusion

The purpose of this paper has been to argue that food advertisements obscure the social, economic, and environmental relations behind animal products. Moreover, I have argued that given the increasing distance between the producers and consumers of food in an industrial and commodity food system, food advertisements have come to serve as educative tools. Overall, as sites of public pedagogy, food advertisements for animal products teach society that food is a commodity to be bought and sold, that farm life is picturesque, rustic, and serene, and that live animals as individual entities are inexistent. Moreover, the advertisements encourage complacency among consumers in not challenging or questioning where their food comes from and thus tacitly reinforce processes that enable commodity fetishism. In order to move forward, I have emphasized the role of critical food pedagogies in not only "removing the veil" (Hudson & Hudson, 2003), but also challenging the underlying generative framework of capitalism that drives our relationship with food and creating counter-hegemonic possibilities for rebuilding the food system. As Sumner (2015) suggests,

> By eating, we can learn to adapt to a dysfunctional individual food system that benefits a privileged few and downloads never-ending, unsustainable costs onto people, communities, nation states, and the environment. But eating can also help us to learn to think, to resist, and to build an alternative future (p. 205).

Through the important pedagogical work done via groups such as Food Not Bombs, Food Empowerment Project, Sistah Vegan Project, Vegan Hip Hop Movement, Vegan Voices of Colour, and Striving with Systems, as well as community focused food initiatives, I believe we can re-learn our way to a more sustainable food system. Further research in this area could explore the particular strategies used by such critical food pedagogies and their efficacy.

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Review Article

The value in community gardens: A return on investment analysis

Susie Cochran* and Leia Minaker

University of Waterloo

Abstract

Food production in cities is increasingly regarded as one of the building blocks for sustainable urban living, particularly as the agricultural industry faces mounting ecological and economic constraints, and the globe continues to urbanize. While substantial research exists on the qualitative outcomes of urban agriculture, few studies present these outcomes in monetary terms that align more closely with municipal decision makers' economic priorities. In response to this gap, this paper reviews the literature on outcomes of one form of urban agriculture: community gardens. We describe impacts that could be quantified and included in a monetary return-on-investment (ROI) analysis, and identify gaps in both research and data for completing such analyses. Economic impacts of community gardens can include increased property values in adjacent neighbourhoods, increasing productivity of vacant lands, the value of food produced, and food bill savings for community gardeners. Environmental impacts can include ecosystem services, protection and revitalization of vacant land, and reducing urban carbon footprints. Social impacts can include improvements in community and individual health, food security, neighbourhood safety and social cohesion, as well as educational and recreational opportunities for residents. In extant literature, outputs of community gardens are rarely quantified, and much of the research to date lacks rigorous evaluation designs. In addition, little research examines unintended consequences of community gardens, including reproduction of inequities. More research needs to be done to accurately estimate ROIs of community gardens.

Keywords: Community Gardens; return on investment; urban agriculture; food systems

*Corresponding author: lminaker@uwaterloo.ca
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Introduction

Food systems face mounting pressure under the weight of a shrinking and aging agricultural labour force (Statistics Canada, 2011), resource depletion (Elton, 2013), climate pressures (Hansen 2015; USGCRP, 2016), population growth, and rapid urbanization. With over 80% of Canadians and more than 50% of the global population living in urban areas (World Bank, n.d.), attention is increasingly turning to the potential of food grown in cities, returning to the idea that "agriculture can and should sustain a city" (Rich, 2012, p.12).

Urban Agriculture (UA) is the production of food in urban and suburban environments. It is most commonly made up of numerous small, dispersed plots situated close to their place of consumption (Dieleman, 2016). Community gardens are one form of UA, and although they take on a diversity of forms, they are generally publicly accessible spaces used by individuals to grow food for personal consumption, sharing, donation, and/or sale (Alaimo et al., 2016).

Farmland is a finite resource quickly being consumed. In Ontario, Canada's most populous province, between 2006 and 2011, an average of 350 acres of farmland per day were lost (Ontario Food and Nutrition Strategy Group, 2017). Some of these constraints on land availability may be ameliorated by creatively making use of available spaces for production where demand exists. Community gardens generally occupy underused urban spaces, transforming these places into productive plots of land and yielding social, economic, and environmental returns. They contribute to the resilience and sustainability of increasingly vulnerable urban food systems (Barbolet, 2009) by providing access to the space (and often tools) necessary for residents to produce their own food.

Despite widespread support and enthusiasm for community gardens, research on their potential and outputs is lacking, and their diverse outputs are difficult to quantify (Guitart et al., 2012; Hou 2009; Voicu & Been 2008). While a growing body of research explores the benefits of community gardens through qualitative studies, few present them in economic or other quantitative terms. In an economic system mediated by the common exchange value of money, that which is not associated with monetary value is often regarded as economically valueless and is thereby externalized from the cost-benefit equation (Greer, 2011). Strategies for measuring community gardens' monetary value may therefore more clearly communicate their benefits to policy makers and governments (Twiss et al., 2003, Voicu & Been, 2008).

Assigning a monetary value to complex, variable results is likely to inadequately capture the extent of their impact or to unequivocally isolate community gardens as the driver of those outputs. That said, what may be an imperfect evaluation may be a springboard for recognition of their potential as a tool for community wellbeing. One method to economically describe the value of community gardens is a Return on Investment (ROI) analysis, which measures the financial gain or loss generated on an investment relative to the amount of money originally invested. It is expressed as a percentage and can be used to guide investment decision making,

with higher percentages indicating a more financially profitable investment. Using an ROI may be an effective method of conveying the value of community gardens in monetary terms, which may help to clarify their place in social, environmental, and economic wellbeing, and may therefore impact how cities invest in their operation.

This paper synthesizes the peer-reviewed and grey literature on community garden outcomes and impacts. We describe those impacts that could be quantified and included in a monetary ROI analysis and identify gaps in both research and data for completing such analyses. Finally, we outline areas for future research that would support the generation of ROI analyses on community gardens, which may then be presented to policy makers and government officials as a case for these gardens' continued expansion.

The paper is divided into three main sections around the categories of community garden outputs identified across the literature— economic, environmental, and social—with a discussion on the subcategories of each (see Table 1). Each section outlines the role that community gardens play in each subcategory, summarizing the findings of studies and what efforts have been undertaken to quantify those findings. Research gaps are identified for each category of community garden impact, highlighting key areas requiring greater study in order to translate their outputs into monetary value.

Methods

This paper surveys academic and grey literature on community garden outputs to identify the extent to which their value has been quantified in monetary form. In terms of geography, we focused our examination of available data for a return on investment analysis on Waterloo Region and Southern Ontario where research was available, incorporating literature from other locations where local information was not available.

Primo Central, an index that provides access to the University of Waterloo's available databases and collections, and Scopus were the primary sources for data collection. The references from relevant articles were also searched to identify further sources. Grey literature was collected using the same search terms, drawing primarily from Region of Waterloo Public Health publications and Canadian non-profit organization reports.

Search terms for the collected literature included the following words: community gardens, outputs, quantifying, outcomes, economic returns, and ecological economics. These terms were variously combined and paired with Boolean operators such as AND/OR to obtain results. Categories of outputs were then formed around the themes found across the literature reviewed, and findings were sorted into three overarching types of outputs: economic, environmental, and social. The specific results of community gardens identified across the literature were then included within the relevant category (see Table 1). The subcategories outlined in Table 1 emerged as studies were reviewed and trends in research were identified.

Table 1: Categories of community garden outputs evaluated

Economic	Environmental	Social
Property Value Productivity of Vacant Land Produce Value Food Bill Savings	Ecosystem Services Protections and revitalization of vacant land Carbon footprint	Learning, Education, Recreation Social Cohesion Food Security Neighbourhood Safety and Crime Prevention Mental Health Physical Health

Literature synthesis: community garden impacts

Economic

Property Values

Urban public greenspaces have been shown to enhance neighbourhood aesthetics, providing attractive spaces for social interaction, increasing supervision and safety, and fostering a "sense of place" (DeFields, 2013). They have been linked to enhanced property values, neighbourhood stabilization, and fewer vacant homes (De Sousa, 2003; Heidt & Neef, 2008; Kelly & Zieper, 2016; McCabe, 2014; Voicu & Been, 2008). The extent of property value impacts, however, remains contested, with impacts largely dependent on site characteristics and context. Table 2 summarizes several studies exploring the impact of various forms of greenspace on property values.

Eight studies assessed the association between community gardens and property values (see table 2). In one study of community gardens in New York City, Voicu and Been (2008) estimate the difference between real estate values near community gardens and prices of comparable properties at a further distance in the same neighbourhood. Property values within 1000 feet of community gardens were found to be significantly and positively affected relative to those further away, with impacts growing over time. Within five years of their establishment, community gardens affected property values by as much as 9.4% (Voicu & Been, 2008). A 2004 study from Michigan found proximity to high quality outdoor spaces positively influenced surrounding housing values, but this was highly dependent on the type of landscape (DeFields, 2013). The presence of large trees or a healthy forest correlated to increased housing values, whereas manicured landscapes and open fields did not (DeFields, 2013) A 2016 study of Kitchener-Waterloo, Ontario found that open space (including parks and sports fields) was negatively correlated with property values for single-detached, semi-detached, and duplex homes (Babin, 2016).

Few studies account for variance of impact between low and high density neighbourhoods, and many are outdated (Bolitzer & Netusil, 2000; Bremer et al., 2003; Liu, 2008, Voicu & Been, 2008). When considering the potential for community gardens to influence property values, the attractiveness of gardens as sites for more economically-advantageous

development is rarely considered. Increased property values may also have implications on the financial accessibility of real estate surrounding community gardens (Funicci et al., 2014), hindering their use as sources of fresh produce for lower-income participants and potentially contributing to patterns of neighbourhood gentrification.

Table 2: Summary of studies on community garden impact on real estate values

Authors, Location, Year	Study Notes	Applicable Results
Bremer, Jenkins and Kanter, Milwaukee, 2003		Cost premium for three-block radius of community garden estimated at $8800 in tax revenue through increased real estate values
Liu, St Louis, 2008	Compared rent prices for properties adjacent to 53 community gardens to control sites	Median rent in community garden vicinity increased by $91 USD between 1990-2000 (compared to static rent city-wide)
Heckert and Mennis, Philadelphia 2012	Evaluated vacant lot greening program's impact on property values	Property values in areas immediately surrounding greened lots increased by up to 30%
Voicu and Been, New York City, 2008	Estimated the difference between properties within 1000 feet of 636 community gardens and comparable properties at a further distance	Within five years of community garden establishment, property values were affected by as much at 9.4% within 1000 feet of the garden. Cumulative benefits estimated at $2 million USD in property value increase per garden.
Bolitzer and Netusil, Oregon, 1990-1992	Studied the impact of open space on property values.	Properties within 1500 feet or 7.5 blocks of a 20-acre open space sold for $2670 (1990 dollars) more. Proximity to any open space was shown to boost sale prices by 1.43%.
Espey and Owasu-Edusei, Greenville South Carolina 1990-1999	Estimated impact of greenspaces on house sale prices	Small aesthetic parks correlated to 11% higher house sale prices within 600 feet
New Yorkers for Parks and Ernst & Young, New York, 2003	Evaluated impact of high-quality parks on home values	Found 8-30% increase in the value of homes located near 'well-improved parks'.
DeFields, Kitchener-Waterloo 2013	Household survey with 206 respondents on the importance of outdoor spaces on housing selection	Over 50% of respondents reported proximity to natural areas (52%) and parks and recreation (57%) as important factors in selecting a living location.

Productivity of vacant land

Vacant public land is often regarded as a fiscal and aesthetic burden (Kaufman & Bailkey, 2000). The United States is home to an estimated 425 000 brownfield sites, covering about five million acres of land and representing approximately $2 trillion USD of undervalued real estate (Kotval-K, 2016). According to San Francisco's Public Works department, each converted brownfield site saved the city approximately $4100 per year in 2012 (SPUR, 2012). Revitalization and greening of these areas has been shown to enhance neighbourhood wellbeing, individual health and safety, economic development, and environmental quality (De Sousa 2003; Kotval-K, 2016; McCabe, 2014).

Community gardens have been recognized as an effective means to transform vacant lands into productive spaces, often at low or no cost to the government (Kaufman & Bailkey, 2000; Nordahl, 2009; Ranney et al., 2010; Voicu & Been, 2008). Their cross-section of social, economic, and environmental returns makes them an inexpensive way to tap into the potential of these spaces (Veenhuizen & Danso, 2007). Municipal governments may avoid substantial costs where vacant lots are converted to community gardens and their maintenance work absorbed by community gardeners, however, further research is required to evaluate when, how, and to what extent this is the case.

Produce value

The value of garden harvests and food budget savings are the most readily quantifiable outcomes of community gardens. However, research on their production is limited given the heterogeneity of garden and gardener characteristics under study, as well as the diverse methods by which researchers have quantified yield and harvest value. It follows that studies present a wide spectrum of production possibilities for community gardens' production potential. Five studies are summarized in Table 3, reflecting the variance in yields and lack of recent studies that capture equivalent produce value when accounting for input costs.

The average community garden plot in Duchemin and colleagues' (2008) Montreal study produced enough to meet the average adult's vegetable needs for the year, but this assumes production extends continuously and consistently throughout the entire year, which is unrealistic for the climate context and associated growing season (Duchemin et al., 2008).

Community gardens can yield significant volumes of fresh food, even if exact values are difficult to obtain (Gittleman et al., 2012). In one study from Guelph, Ontario, the average yield for 50 community gardeners was 1.43 kg per square meter (Codyre et al., 2012), or roughly 20.4 servings of fresh produce per square meter over the growing season. The authors estimate 197 000 kg of mixed vegetables were produced by Guelph gardeners using approximately 13.76 ha of land. This volume of fresh produce would be sufficient to meet the vegetable demand of nearly 2900 people, or 2% of Guelph's population. If 10% (as opposed to the current 0.5%) of Guelph's potential yard space was used at the average productivity rate, the authors conclude that Guelph could produce 3.86 million kg of produce annually; enough to feed 56 000 people or 46% of the city's population for a year.

Table 3: Summary of studies quantifying garden yield

Authors, Location, Year	Yield	Produce Value

Duchemin et al., Montreal 2008	35.2 lbs per gardeners per season	
Algert et al., San Jose 2014	0.75 lbs/sq. ft, 292.18 pounds per season	
National Gardening Association, United States 2009	0.5 lb./sq. ft, 300 lbs per season (600 sq. ft plot)	$600, $530 after input costs ($1/sq. ft, $0.88 after inputs)
Codyre et al., Guelph 2012	0.29 lbs/sq. ft, 4.14 lbs/sq. ft	$3.16-$5.56USD per kilogram (depending on the grocery store)
Gittleman et al., New York 2010-2011	1.2 lbs/sq. ft 2010, 0.33 lbs/sq. ft	$3/sq. ft 2010 USD, $1.15/sq. ft

Food bill savings

Building on research quantifying community garden production are studies that explore a commonly-cited benefit for participants: reduced food budget costs (Bellows et al., 2004; Carney et al., 2012; Corrigan, 2011; Gregory et al., 2016; McCormack et al., 2010; Veenhuizen & Danso, 2007). Participants in one New York study reported substantial cost savings, and 77% harvested enough to meet at least a third of their household produce needs (Gregory et al., 2016). In a study from rural Oregon, concerns of household food security dropped from 31% to 3% among a sample of migrant seasonal farmworker families following participation at community gardens (Carney et al, 2012).

The limited research in this area identifies a wide spectrum of potential food budget impacts, affected by factors such as garden input costs, yield, and the types of crops grown (Algert et al., 2014; Armstrong, 2000). Food bill savings are also dependent on methods and efficiency of production, where only a small proportion of the 50 gardeners surveyed in Guelph could produce at comparable prices to store-bought equivalents, and most were paying an average premium of 39% for their home-grown produce (excluding the cost of their labour) (Codyre et al., 2012). Studies typically evaluate impacts on food budgets by engaging gardeners in qualitative evaluations (e.g., Moskow's 1999 analysis of household food cost impacts through participant interviews) or quantitative analyses (e.g., Codyre and colleagues' 2012 study where garden yield and input costs were compared with the average costs of equivalent foods at grocery stores).

Site-specific studies are required to test whether food budget savings apply to particular contexts. Few studies express food budget savings in transferrable terms (e.g., as a value per square foot) making it difficult to apply findings to other locations. Even where savings per unit of area are provided, studies are further limited by context specificity as they only represent the productivity average of one particular set of garden conditions. Further, studies often assess the net value of community garden produce using inconsistent references for food prices (i.e., one may use a unit cost from a high-end supermarket in New York while another uses unit costs from farmer's markets in Vancouver) and without accounting for the value of labour inputs.

Environmental

UA may be a more environmentally sustainable form of production due to its shortened travel distance between producer and consumer, minimal packaging and processing, and use of waste or rainwater (Lovell, 2010). Research on the connection between community gardens and environmental outputs or valuation is limited. Indeed, UA's potential as a more sustainable food system compared to conventional agriculture is highly dependent on context and the form of UA employed (Calvet-Mir et al., 2011; Goldstein et al., 2016). For example, a study on urban versus conventional agriculture identified four types of UA based on material/energy characteristics and environmental performance and measured each form of UA's environmental impacts against traditional agricultural regimes (Goldstein et al., 2016). This study found that although some of the UA systems performed well when compared to conventional systems, results varied significantly based on the material and energy resources used and the environmental context (e.g., climate).

Community garden ecosystem services

A range of ecosystem services—defined as the benefits people gain from natural systems (WHO, n.d.)—are associated with UA, but little research has been done in this area. One study on allotment gardens in Poznan, Poland and Manchester, United Kingdom tested for 26 ecosystem services, including food provision, flood protection, water purification, and pollination, and found that the total value of ecosystem services for allotment gardens in both cities exceeded those of park areas (Speak et al., 2015). Similarly, a Spanish study engaged home gardeners to evaluate perceived value of ecosystem services (Calvet-Mir et al., 2011), identifying nineteen ecosystem services across four categories: regulating (including disturbance buffering, soil formation and fertility, pollination and enhanced crop production); habitat/support for wild plants and animals, and maintenance of genetic diversity; production (e.g., food, raw materials, and medicinal and ornamental resources); and cultural (e.g., aesthetics, social relationships, maintenance of traditional ecological knowledge).

Several of these ecosystem service outputs are not well documented across the literature; community gardens have been argued to improve air quality (Nordahl, 2009; Toronto Food Policy Council, 2012), stormwater management (Nordahl, 2009; Toronto Food Policy Council 2012), urban heat islanding or temperature regulation (Clarke & Jenerette, 2015; Lin et al, 2015; Nordahl, 2009,), and biodiversity or habitat provision (Calvet-Mir et al., 2011; Clarke & Jenerette, 2015; Lin et al., 2015; Toronto Food Policy Council, 2012), but often with limited substantiation.

Despite the challenge of quantifying environmental outcomes of gardens, efforts to tackle the monetary valuation of ecosystem services—such as the economics of ecosystems and biodiversity—offer promising avenues to capture community gardens' environmental services.

Protection and revitalization of vacant land

Community gardens are often associated with revitalization of urban lands through neighbourhood beautification and restoration, transformation and care for previously un-maintained landscapes, and urban greening (Calvet-Mir et al., 2011; Kelly & Zieper, 2016; Miccoli et al., 2014; Moskow, 1999; Nordahl, 2009; Toronto Food Policy Council, 2012; Veenhuizen & Danso, 2007; Zeeuw & Drechsel, 2015). Particularly in urban settings, which generally are dominated by low biodiversity landscapes, UA has great potential to enhance species and landscape diversity (Lin et al., 2015). Whereas this output is explored by several studies, no research quantifying the value of this revitalization of urban spaces was found.

Carbon footprint

One of the foremost assumptions about UA versus conventional agriculture is reduced greenhouse gas emissions from shortened food value chains (Miccoli et al., 2014), however research on UA's environmental footprint is mixed. For example, four studies have examined the carbon sequestration capacity of urban greenspaces and agriculture using lifecycle analyses. These assessments attempt to compare the full lifecycle impact of UA versus conventional agriculture. Three of the four lifecycle analysis studies found that at least some aspects of UA could produce emissions reductions relative to conventional methods, but these reductions were context-specific (Benis & Ferrão, 2017; Cleveland et al., 2017; Goldstein et al., 2016), while one study found no significant changes in soil carbon content in a vegetable plot across the three study years (Whittinghill et al, 2014).

In sum, the potential contribution of community gardens to the health and resilience of urban ecosystems may be significant but has been insufficiently researched. As increased research in environmental economics makes estimation of these outputs more accessible, they can be incorporated into future ROI assessments to better capture their monetary value.

Social

Many have argued that community gardens are associated with an array of potential benefits for individual participants, their households and broader communities, such as enhanced community self-sufficiency and resilience, improved food security and mental health, and increased social cohesion (Armstrong, 2000; Bellows et al., 2004; Brown & Jameton, 2000; Hou, 2009; Rich, 2012; Van den Berg et al., 2010; Vitiello & Nairn, 2009; Miedema et al., 2013).

Such outcomes, however, are extremely challenging to quantify. For example, community engagement may be quantified based on the proportion of residents involved in various local initiatives before and after the garden's establishment. However, the subsequent monetary valuation of this enhanced engagement is not straightforward. The areas of greatest opportunity to quantify potential impacts in this category include: monetary valuation of educational outcomes; any reductions in community law enforcement costs due to increased

neighbourhood cohesion and safety; any reductions in dependence on mental health services due to impacts of improved mood, social connectedness, and improved food security; and any reductions in public health service costs due to improvements in physical health. Many of these remain contested or insufficiently studied community garden outcomes, as we discuss in the subcategories below.

Community health

Community gardens have been described as "a catalyst for community participation and community revitalization" (Hou 2009, p.22), serving as robust alternatives to vacant plots which are often associated with undesirable impacts including heightened criminal activity, dumping, and safety hazards (Schukoske, 2000). They are purported to support neighbourhood self-sufficiency, cross-cultural interactions, and social ties (Alaimo et al., 2016; Dieleman, 2016).

Learning, education and recreation

Community gardens are recognized as sites of informal learning opportunities (Alaimo et al., 2016; Drake & Lawson, 2015; Hou, 2009; Ranney et al., 2010; Schmelzkopf, 1995' Veenhuizen & Danso, 2007), including agricultural training programs (Rich, 2012), environmental education, and scientific research (Calvet-Mir et al., 2011). Participants have reported increased knowledge of food production, greater awareness of environmental issues, improved dietary behaviours and preference towards fruits and vegetables, and deeper respect for farmers (Miedema et al., 2013).

Community gardens have also been recognized as a form of recreation (Calvet-Mir et al., 2011; Veenhuizen & Danso, 2007) and for their impact on youth development. Research on neighbourhood community garden youth programs in Flint, Michigan found they provided a constructive activity where participants could contribute to their community and develop several important skillsets (social, nutritional, agricultural) (Ober Allen et al., 2008).

Social cohesion

Community gardens are often regarded as fertile grounds for social interaction and community building (Calvet-Mir et al., 2011; Duchemin et al., 2008; Ober Allen et al., 2008; Veenhuizen & Danso, 2007), particularly given their location in public spaces. They have been described as 'social anchors' for a community (Rich, 2012), facilitating social interaction across age, cultural, and income groups (Miedema et al., 2013; Ranney et al., 2010; Veenhuizen & Danso, 2007). Studies across Australia, North America, and the UK suggest that food production is linked to community development, and that "gardens can contribute to social capital through civic engagement" (Drake & Lawson, 2015, p.243).

By introducing what Hou describes as a "community commons" (Hou, 2009 p. 22) where neighbours can interact, community gardens may contribute to placemaking, neighbourhood

resilience, autonomy, and pride (Alaimo et al., 2016; Armstrong, 2000; Calvet-Mir et al., 2011; Hanna & Oh, 2000; Hou, 2009; Litt et al., 2015; Ober Allen et al., 2008; Ranney et al., 2010; Rich, 2012; Vitiello & Nairn, 2009). A study by Kuo and colleagues (1998) found that higher levels of vegetation in a neighbourhood common space are associated with stronger social ties, and several studies indicate that robust social ties form a "social unit more capable of forming local organizations, defending against crime, and mobilizing for political purpose" (Kuo et al., 1998, p.824). In other words, connected neighbourhoods with strong relationships of mutual trust yield increased local capacity and more engaged, resilient communities.

Revitalization of vacant land has been shown by several studies to improve community wellbeing and public health, particularly when it is transitioned into a site of "purpose, people, and active use" (Garvin et al., 2012, p. 422). As one form of brownfield greening that fulfills all three of these attributes, a community garden has the potential to act as "a catalyst for community participation and…revitalization" (Hou, 2009, p.22).

Enhanced social connectedness can improve neighbourhood support networks and build trust, strengthening the social fabric of a community (Alaimo et al., 2016). Research by the National Collaborating Centre for Healthy Public Policy found that a sense of community belonging was positively associated with individual health (Watson & McDonald, 2016). A study by Waterloo Region Public Health found that 81.8% of individuals with a strong sense of community belonging were satisfied with their mental wellness, compared to 58.1% of those with a low sense of belonging (Watson & McDonald, 2016).

While qualitative research validating community gardens' impact on community connectedness and resilience is strong, this outcome remains extremely challenging to estimate in economic terms.

Food security

The World Food Summit of 1996 defined food security as an interplay between four dimensions: food access, availability, utilization, and stability. Together, these dimensions form a state of food security where "all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (FAO, 2006, p.1). Household food insecurity is defined as "inadequate or insecure access to food because of financial constraints" (Tarasuk et al., 2016, p.2).

In Ontario, an estimated 12.5% (or 1.7 million) of households were food insecure in 2012 (Ontario Food and Nutrition Strategy Group, 2017). Food insecurity has been associated with reduced physical and mental health, increased risk of chronic disease, hindered school success and childhood development, and heightened potential to become higher-cost healthcare clients (Birmingham, 2008; Ontario Food and Nutrition Strategy Group, 2017; Tarasuk et al., 2015). Household food insecurity is a robust predictor of health care utilization and costs among adults in Ontario, even after controlling for several social determinants of health (Tarasuk et al., 2015).

The studies summarized in Table 4 show that UA may enhance food security as a relatively low-barrier option to increasing household food supply (Avila & Veenhuizen, 2002; Veenhuizen & Danso, 2007) and by improving access to fresh food (Alaimo et al., 2008; Armstrong, 2000; Rich, 2012; Wang et al., 2014). The five studies captured in Table 4 describe qualitative results from participants who experienced improved food security due to involvement in community gardens, and significant quantitative results on the production potential of gardening compared to average adult fruit and vegetable needs. For example, in a New York study of 61 urban gardens, 55% of gardeners reported sufficient harvest to meet two-thirds of their vegetable consumption (Gregory et al., 2016).

Table 5: Summary of studies on community garden impact on food security

Authors, Location, Year	Study Notes	Applicable Results
Gregory, Leslie & Drinkwater, New York City 2015	Engaged 61 food-producing gardens across 2011-2012. 40% of gardens were less than 500 meters squared, about 70% under 1000 meters squared.	55% of gardeners reported sufficient harvest to meet 2/3 of their vegetable consumption, 22% produced between 1/3-2/3 of their produce needs.
Vitiello and Nairn, Philadelphia 2008	Summary of Philadelphia community garden production and distribution, involving site surveys, harvest-weighing and gardener interviews.	Nearly 12 000 pounds of fresh vegetables distributed to food banks through gardener donations to City Harvest 2008
Duchemin Legault & Wegmuller, Montreal 2008	Engaged over 560 participants in a study of Montreal's urban agriculture.	Average garden yield was about 16 kilograms per gardener over the growing season (May to October), enough to meet average produce needs of one adult if production was to remain constant throughout year
Carney et al, Oregon 2011	Examined community gardens' impacts on 42 seasonal migrant worker families in a rural community, 2009	Food security concerns diminished following participation in community gardens (from 31% to 3%)
Kobayashi, Tyson & Abi-Nader, USA, 2010	Examined impact of Community Food Projects Competitive Grant Program (CFPCGP) which supports community food projects across the United States (30% of projects community gardens).	Between 2005 and 2009, almost 19 million pounds of local produce distributed through 307 CFPCGP projects, with impacts concentrated in low-income communities across in 39 states

Research on squatter and community gardens in Philadelphia found that the 600 surveyed sites were concentrated in lower-income neighbourhoods, with the potential to support food security among lower-income residents (Vitiello & Nairn, 2009). Insofar as community gardens are regarded as enablers of food security in lower-income neighbourhoods, their spatial distribution and demographics are highly variable and depend on local context. For example, in Portland and

Vancouver, residential gardeners were predominantly white, female, older, more highly educated, and wealthier compared to population averages for the cities (Mclintock et al., 2013). Community gardens are not always located in the lowest income areas and are sometimes not used by low-income residents even when gardens are located in these areas (Smith et al., 2013). In a Toronto survey of community food programming projects (community gardens, food box programs, and community kitchens), low participation rates were found among low-income residents and these programs were found to be ineffective in supporting their needs (Loopstra & Tarasuk, 2013).

On the other hand, several studies suggest that community gardens have promising potential as a food security intervention and that many are effectively used in higher-needs neighbourhoods (Garrett, 2015; Voicu & Been, 2008). In New York, census tracts with gardens had significantly lower mean income ($29 649 USD) compared to areas without gardens ($45 593 USD), higher unemployment and poverty rates, and lower education and ownership rates (Voicu & Been, 2008). A National Gardening Association survey found that although a significant number of higher income-earners participated in food gardens, the largest household income group of community gardeners earned between $35-$49 999 USD (24% of respondents), with 21% earning under $35 000 (National Gardening Association, 2009). Continued research on food security outcomes associated with UA is needed to validate this relationship (Mah et al., 2014).

Crime prevention and neighbourhood safety

Research is currently insufficient to draw robust conclusions about the association between crime and community gardens, however studies indicate that greening interventions or increased healthy vegetation correlate to enhanced sense of safety and declines in robberies, burglaries, property crimes, vandalism, theft, and violent crime (Bogar & Beyer, 2016; Garvin 2012). Efforts to reduce or prevent criminal behavior can have substantial ripple effects on community wellbeing and lowered policing costs. Beyond immediate crime response expenses, the total costs of crime and victimization were estimated at $99.6 billion in 2008 (Zhang, 2011), or about $114 billion in 2017 dollars. These costs include expenses associated with courts, prosecution, legal aid, correction, victim support, and compensation (Zhang, 2011).

Community gardens have been found to positively impact neighbourhood security (Armstrong, 2000; Moskow, 1999; Ladner, 2011; Ober Allen et al., 2008), providing safe spaces which are invested in and valued by the community. Research generally evaluates impacts of community gardens on neighbourhood safety based on differences in incidents of crime before and after a garden's establishment, or through a comparison of crime rates in neighbourhoods with community gardens versus control sites.

Table 5 distills the findings of five studies evaluating the impacts of community gardens and vacant lot greening on crime. While the findings are inconsistent across the urban environments studied and are noted to have been limited by sample size, timespan, and difficulty isolating

community gardens as the causal variable, each of the studies did identify positive results from increased greenspace and/or the introduction of community gardens. In one study of three community gardens in Kitchener, Ontario, respondents reported that gardens foster a sense of neighbourhood security by increasing resident interaction across cultural, age, and socioeconomic divides, transforming previously disorderly sites and increasing informal surveillance or visibility at the site (Herod, 2012).

A systematic review of the relationship between greenspace, violence, and crime found that 19 studies reported positive impacts of greenspace on neighbourhood safety, and nine showed a negative relationship (Bogar & Beyer, 2016). This variance is believed to result from differences in neighbourhood socioeconomic characteristics prior to greening, the type of greenspace, and type of crime (Bogar & Beyer, 2016' Garvin, 2012; Heckert & Mennis, 2012).

Table 6: Impact of community gardens on crime

	Description	Impact
McKay, Kitchener, Ontario, 1994	Assessed the impact of Victoria Hills community garden on police incidents	Incidents dropped by 30% the summer following the community garden's establishment and nearly 56% by the third summer.
Garvin, Philadelphia, Pennsylvania, 2011	Randomized testing of vacant lot greening (cleaning lots, planting grass/trees, fencing perimeter) on reported crime, safety, and disorder. Research engaged 29 participants, 2 intervention sites and 2 control sites	Total crimes at intervention sites increased slightly, however a net reduction in perception of disorder was found among residents by intervention sites compared to control sites. The sample size and timespan of this study posed significant limitations to findings.
Gorham, Waliczek, Snelgrove & Zajicek, Houston, Texas, 2009	Evaluated impacts of 11 community gardens on reported property crimes when compared to control sites.	Interview participants reported reductions in illegal activities such as dumping or drug activity, increased property values, neighbourhood redevelopment and increased resilience against crime. Only 1 of 6 gardens evaluated in-depth showed statistically-significant change in property crime rates of the garden site versus control site. The remaining 5 sites showed mixed results. Community gardening is concluded to be a tool for community revitalization, but not a predictor for neighbourhood property crime.
Kondo, Hohl, Han & Branasl Youngstown Ohio, 2010-2011	Compare neighbourhood crime rates between vacant lots and greened lots (remediated through a city-led brownfield revitalization program). 47 out of the 77 lots included in the program were converted into community gardens, urban farms or orchards.	Community-led revitalization projects showed the greatest reductions in felony assaults and burglaries. The greened lot program led to statistically significant decreases in burglaries, robberies and felony assaults.
Snelgrove, Michael, Waliczek & Zajicek, Austin, Texas, 2004	Evaluate relationship between crime and greenspace	Findings indicate that higher levels of greenspace support reduced criminal activity and safer communities

Whereas the findings of these studies and assertions present mixed evidence of correlation between the presence of community gardens and crime prevention, they collectively

present evidence that gardens can support residents' perceptions of neighbourhood safety. The studies are limited in that they employ inconsistent references against which garden impacts can be measured (i.e., crime reporting rates, incident rates, comparisons of criminal activity pre-and-post garden establishment or comparison to control sites), and many call for continued research to explore this relationship. Studies on comparative crime rates and community safety between garden and control sites must delve more deeply than basic measures like percentage changes in crime reporting, since these measures can have several root causes and misrepresent the circumstances (e.g., increased reporting of crime by residents may be indicative of increased investment in the community and informal surveillance, not necessarily a rise in crime incidents).

Individual health

Mental health

Mental and physical health are widely understood as deeply interconnected dimensions of individual well-being (Watson & McDonald, 2016) and support for mental health is regarded as essential to a community's overall health and safety. The WHO 2014 Mental Health estimated that mental illness-related healthcare in Canada cost roughly $42.3 billion in 2011 (Smetanin et al., 2012). Estimated costs of mental illness rarely capture long-term, persistent costs or indirect expenses. These indirect and long-term impacts are difficult to quantify, but they are substantial. For example, Canada's workplace productivity loss resulting from mental illness was an estimated $6.4 billion in 2011 (Watson & MacDonald, 2016).

Natural spaces promote individual wellness (Adevi & Lieberg, 2001; Beyer et al., 2014; Van den berg et al., 2010), and community gardens have been tied to significant improvements in participant mental health (Carney et al., 2012; Clatworthy et al., 2013; Husqvarna Group, 2013; Ladner, 2011). Research in this area typically measures mental health impacts based on differences in symptoms of mental health (e.g., stress, anxiety, depression) between gardeners and non-gardeners, or more broadly between residents in neighbourhoods with higher levels of greenspace than others.

Gardeners report lower levels of depression and anxiety and improved mood, self-esteem, social skills, sleep, and physical health relative to non-gardeners (Clatworthy et al., 2013; Mah et al., 2014). Gardening may act as a powerful tool which contributes to feelings of vitality and wellbeing in individuals struggling with mental illness (Adevi & Lieberg, 2011). However, research presents varied and insufficient data on mental health impacts over the long-term (Clatworthy et al., 2013), rarely considering how these improvements impact mental health service use and healthcare costs. Such analysis is necessary to capture monetary impacts of community garden-related mental health improvements.

Physical health

Improvements in nutrition (Alaimo et al., 2008; Bellows et al., 2004; Wang et al., 2014; Vitiello & Nairn, 2009) and physical activity are often purported to be associated with community garden participation, however, these outcomes continue to be debated and require further research to validate.

The presence of parks and open spaces in a community have been found to positively correlate to increased desire of residents to be physically active, particularly for seniors (Alaimo, 2016; Power Up for Health Foundation, 2016). Conversely, a 2003 literature review on the impact of UA interventions on nutrition found mixed results among study participants and insufficient evidence to substantiate the connection (Berti et al., 2004).

Studies in this area are limited by small sample sizes, lack of control groups, failure to account for self-selection or sample bias, and inconsistent indicators or measurements for analysis. Results on physical health impacts are inconsistent, and sometimes rest on un-validated assumptions of community garden outcomes (Mah et al., 2014).

Conclusions and directions for future research

The production of food in cities is increasingly being explored as a dimension of sustainable urban living. The outputs of UA are rarely quantified, however, which may hinder recognition of their value among decision makers. In response to this gap, this paper has reviewed the literature on community gardens' social, environmental, and economic impacts with an eye towards data needs to complete an ROI analysis.

The contextual diversity of community gardens makes site-specific data extremely important and hinders cross-application of studies from other contexts, however, local-level data and controlled studies remain sparse. Research areas requiring further site-specific or controlled studies include the impacts of community gardens on food bill savings and produce value, gardens' ecological impacts such as carbon sequestration and stormwater management, as well as food security outcomes.

Future research should build on several shortcomings in current studies. Impacts of community gardens on property value must account for other factors affecting real estate markets, potential unintended outcomes such as gentrification, and variation of impacts due to neighbourhood density. Assessments of the relationship between neighbourhood safety and community gardens require consistent measurement of impact (e.g., crime reporting rates) and should investigate how community gardens and crime are associated. Physical health impact studies require larger sample sizes, control groups, and consistent indicators of assessment. Mental health studies must capture longer-term impacts of community gardens on mental wellbeing and consider the direct effect of participation on mental health service use.

Research is also inadequate in its consideration of potential unintended outcomes of community gardens and their implications for social equity. Gardens' accessibility across

variables such as age, background, and economic status must be explored to better understand how impacts are distributed across a community.

In conclusion, data and research on community gardens is currently inadequate to generate accurate ROI analyses. However, there is significant potential for such quantitative measurement of their outcomes to reflect their value in policy making. Further research is needed to enable production of ROI assessments of these spaces to guide investment decisions around the place of community gardens in community wellbeing and sustainable urban food systems.

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Book Review

Indigenous food systems: Concepts, cases and conversations

Priscilla Settee and Shailesh Shukla (Eds)

Canadian Scholars' Press, 2020, 284 pages

Review by Kristen Lowitt[a*]

Food was a fundamental tool of colonization, used to oppress and dispossess Indigenous peoples from their cultures, knowledge, and land. However, food can also be a powerful tool for reconciliation. Food has become a critical site of decolonial struggle as seen in the efforts of Indigenous people around the globe to reclaim their food systems and establish ways of harvesting, producing, and preparing food that nourish both people and the land. The edited collection *Indigenous Food Systems: Concepts, Cases and Conversations* by Priscilla Settee and Shailesh Shukla explores these issues focusing on Turtle Island (North America).

With contributions from Indigenous scholars, communities, and non-Indigenous allies, a compelling attribute of this book is that it demonstrates Indigenous food systems in action. Through numerous case studies and rich descriptions of place-based food practices, the book celebrates Indigenous food systems and the diverse cultures and knowledge systems they are based in. The text recognizes that reconciliation is not just about righting past wrongs or about establishing respectful Indigenous-settler relationships but is about the active *resurgence* of Indigenous cultures and identities as enacted through food. The book is targeted towards upper-level undergraduate and graduate level students, with each chapter containing a useful set of learning objectives, key terms, suggested reading and resources, and discussion questions. However, the book's broad engagement with food systems theory and empirical case studies will make it appealing to food studies practitioners and scholars as well.

The collection begins with an introductory chapter that presents the key terms used in the book, including food security, food sovereignty, Indigenous food sovereignty, and Indigenous foods, and provides a brief overview of the collection. The accessibly written and succinct

*Corresponding author: lowitt@brandonu.ca

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description of key terms in this first chapter promises to make it a helpful reference guide for students. The collection then proceeds in three parts: concepts, cases, and conversations.

The first section, Chapters 2-5, elaborates concepts important to understanding Indigenous food systems. In Chapter 2, Dawn Morrison describes how a capitalist and production-oriented agricultural paradigm has made Indigenous food systems invisible. She stresses the importance of renewing Indigenous food sovereignty based in principles of self-determination, the sacredness of food, participation in land-based activities, and policy. It is appropriate that this chapter is placed early in the book since the theory and practice of Indigenous food sovereignty, described in detail by Morrison, lays the basis for the chapters that follow. In Chapter 3, Elisa Levi demonstrates a strength-based approach to food security by documenting the practices used to maintain food security at individual, family, and community levels in the community of Elsipogtog First Nation. In Chapter 4, Agnieszka Pawlowska-Mainville identities the unique features of Anishinaabe food systems in the boreal forest using Poplar River First Nation as a case study. In Chapter 5, Leslie Dawson applies critical discourse analysis to look at how colonialism and the Eurocentric foodway operates in Canada's Food Guide.

The second section of the book, chapters 6-10, features community-based case studies. While providing practical examples of Indigenous food systems the authors also share considerable methodological detail that illuminates the process of partnership-driven Indigenous research. Erynne M. Gilpin and Mary Hayes in Chapter 6 describe land-based food and education as entryways into establishing Indigenous food system governance, drawing on the experiences of the W-JOLELP Tsartlip First Nation Garden Project. Chapter 7 presents Asfia Gulrukh Kamal's case study of the O-Pipon-Na-Piwin Cree Nation's intergenerational community-based food program based in oral storytelling traditions. Chapters 8 and 10 focus on urban settings, with Tabitha Robin (Martens) and Jaime Cidro (Chapter 8) looking at access to traditional foods in Winnipeg's inner city. Chapter 9 by Hara Nikolopoulos, Anna Farmer, David Dyck Fehderau, Joanna Campiou, and Noreen Willows describes a workshop series developed to support community capacity to form a food policy council in Alexander First Nation in Alberta. In Chapter 10, Lise Kouri, Rachel Engler-Stringer, Tenille Thomson, and Melody Wood explore the food practices of urban Indigenous households and share the experiences of the Good Food Junction in Saskatoon in trying to support Indigenous food sovereignty in an urban environment.

The final section of the book, chapters 11-15, offers commentaries on contemporary issues that crosscut many of the chapters in the book. In Chapter 11, Shirley Thompson and Pepper Pritty look at how modern development and the destruction of land impedes food security in northern and remote communities drawing on the case of the O-Pipon-Na-Piwin Cree Nation. In Chapter 12, Priscilla Settee reviews the impacts of climate change on Indigenous food systems and the importance of Indigenous knowledge in mitigating climate change. In Chapter 13, Brielle Beaudin-Reimer looks at Métis perspectives and contributions to the social, economic, legal, and political history of Indigenous food systems in Manitoba. In Chapter 14, Hannah Tait Neufeld shares the food experiences of Elder Indigenous women living on and off reserve considering the

impacts of environmental dispossession, residential schools, the wage economy, and urbanization. The final chapter in this section is a thorough synthesis by the editors that ties together the various chapters of the book through an analysis of the unique features, challenges to, and strategies for supporting Indigenous food systems.

One thing I would have liked to have seen is an expanded introductory chapter by the editors laying out the context for the collection, including a history of colonialism in Canada, Treaty relationships, and discussion of reconciliation. Much of this is covered to varying degrees by the authors within their respective chapters; however, a more comprehensive introductory chapter could have reduced repetition in background material across chapters while further setting the scene for the chapters that follow.

Overall, this text is a timely addition to teaching and scholarship on Indigenous food systems. It contains numerous pedagogical features that will make it easy to use in the classroom. At the same time, it is an important contribution to collaborating with Indigenous peoples and their food systems in support of maintaining and reviving not only food systems but the sovereignty of Indigenous nations themselves. As the editors point out, “Indigenous Peoples must be food sovereign in order to be sovereign as a Nation” (pg.1).

Kristen Lowitt is Assistant Professor in the School of Environmental Studies at Queen's University. Her research is directed towards working with communities to build just and sustainable food systems. Interests include the role of fisheries in sustainable food systems, Indigenous food sovereignty, and collective action in food systems governance.

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Book Review

The strawberry squeeze—a review of Wilted: chemicals, pathogens, and the fragile future of the strawberry industry

Julie Guthman

Critical Environments: Nature, Science, and Politics/University of California Press, 328 pages

Review by Janette Haase

The picture on the cover of Julie Guthman's latest book *Wilted: Pathogens, Chemicals and the Fragile Future of the Strawberry Industry* depicts a strawberry made of oil, its tiny seeds visible on the dark blueish black flesh. The leafy top is a yellowish-brown colour, a far cry from the vibrant green that would crown a healthy strawberry. Unfortunately, this is a fitting depiction of the California strawberry industry, plagued by fungal diseases and pests, and propped up by oil-based agricultural chemicals and acres of plastic tarping. The only thing missing from the book's cover picture are the dollar signs, a testament to the profits that greedy industry players have exacted at the expense of the environment and low-wage workers.

Guthman's book draws on extensive, interdisciplinary research, including interviews with growers, farm workers, scientists, and industry, as well as historical accounts and past and present publications. The result is an in-depth account of the development and subsequent entrenchment of an industry that is finding that the chickens do eventually come home to roost. California's strawberry industry began in the mid 19th century and was centered in the warm climate and fertile lands surrounding San Francisco and Los Angeles. *Verticillium Wilt,* a fungal disease present in all soils, flourished in the monoculture fields and became a significant problem in the 1920's and 1930's, resulting in greatly decreased yields. But two World Wars left the United States with an abundance of toxic chemicals, among them chloropicrin (aka tear gas) and methyl bromide, which had been used as a de-lousing agent. When injected into the soil these two chemicals were found to kill the disease-causing fungi. Add to the mix 1,3 dichloropropene, a cheap and toxic by-product of the oil industry, and yearly widespread soil fumigation became the 'fix' that growers were looking for.

*Corresponding author: janettehaase@gmail.com
DOI: 10.15353/cfs-rcea.v7i1.420
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The strength of *Wilted* lies in the detailed way in which Guthman ties together the economic, scientific, social, and environmental developments that have occurred in the strawberry industry, all of which are predicated on the adoption of fumigation as a foundation for successful cultivation. With fumigants acting as insurance against crop loss, plant breeders no longer bred for disease resistance and focussed instead on developing cultivars that were high yielding and productive all year round. Plant breeding is an integral part of the strawberry industry because in the monoculture fields new plants or 'starts' must be planted every year. Genetics become a commodity and proprietary interests mean breeders can charge high prices for their product. As yields increased so did the supply, so marketing interests stepped in to promote the California strawberry as one of nature's healthiest foods. Breeders looked for varieties that shipped well and were durable, further weakening the resilience of their cultivars because, as Guthman explains, there is only so much carbon in an organism and if allocated to one trait, it must detract from another. As the industry grew, profits increased and so too did land rents. An expectation for high profits resulted in downward pressures on labour cost, further marginalizing migrant workers. Over time the industry became dominated by a few vertically integrated firms that controlled plant breeding, marketing, and shipping. Guthman refers to this as the *Strawberry Squeeze* in which growers are caught between high costs of production (about $68,000 U.S. per acre per year in 2015) and the prices that the buyers and shippers are willing to pay.

And then comes the unravelling: a shortage of labour due to the United States federal government crackdown on undocumented workers; the emergence of other pathogens in the seriously depleted soil; and a ban on methyl bromide, the cheapest and most effective fumigant, because of its ozone depleting properties. With population growth in the areas around the strawberry fields, no viable alternative to methyl bromide has appeared, often because of concerns about the effects of chemical drift on residents—an issue largely ignored in the case of the migrant labourers who have applied these fumigants for almost a century. To make matters worse, even as methyl bromide was being phased out, plant breeders continued to be complacent and delayed selecting for disease-resistant traits. Drought and extreme weather have increased stressors to the already fragile cultivars, resulting in increased costs and decreased yields. Grower profits fell from an average of $8,000 U.S per acre in 2010 to $2,300 per acre in 2016.

Wilted paints a picture of an industry that has become a socio-ecological disaster. Yet, while Guthman expertly narrates the historical trajectory and political economy of the strawberry industry she neglects to consider the multiple externalities such as greenhouse gas emissions, water table depletion, plastic waste, and the repair of lifeless and exhausted soils that will eventually be borne by society at large. Her discussion of organic and agroecological practices is limited and ultimately assessed as "not a replicable model for the larger strawberry industry, not in this ecology, not in this economy" (p. 204). Furthermore, she entertains a number of unsustainable alternative practices such as the use of coir or peat based soilless systems and '*anaerobic soil disinfestation'* whereby fields are flooded with water and injected with a carbon source such as rice bran or molasses.

Guthman's begrudging acceptance of the status quo as lacking a viable alternative reflects both a lost opportunity and a lack of vision that undermines the potential of this book. There are too many places where Guthman sits on the fence, acknowledging the myriad of social and environmental harms while defending the need for consumers to have year-round access to "abundant, healthy and affordable strawberries" (p. 197). There are no easy answers, but surely we need to acknowledge the ecological limits of our planet for growing food. A truly healthy strawberry must be one that is grown fairly and sustainably. We can be innovative and bold and search for real solutions. All of us—consumers, farmers and industry—can change the way we think about food and farming and profit; many would argue that if we don't do it soon, ecological collapse will be the very painful ending to this tale.

Janette Haase worked for many years as an organic market gardener. She is the author of From Seed to Table *(Insomniac Press, 2009) and has facilitated many school and community garden projects in the Kingston area. She is currently completing her M.Sc. at Queen's University researching school garden programs. She lives on Wolfe Island near Kingston.*

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Book Review

The sociology of food and agriculture

Michael Carolan

Routledge, 2016, 348 pages

Review by Serge-Olivier Rondeau[1]

«Is anything as simultaneously familiar and distant as food» (p. 1)? C'est la question que pose Michael Carolan, professeur de sociologie à la Colorado State University et auteur de nombreux ouvrages dans le champ de la sociologie de l'agriculture et de l'alimentation (SAA), en ouverture de ce livre. Ce dernier a été initialement publié en 2012 et cette deuxième édition est parue en février 2016. Dans les «pays à revenu élevé», les allées des supermarchés se substituent à la participation quotidienne de la plupart des gens dans des activités agricoles, à la vue des cultures et à l'odeur des animaux d'élevage. Dans ce contexte, propre à une poignée de pays, les trajectoires des aliments jusqu'aux épiceries sont particulièrement difficiles à retracer pour les consommateurs. Partant de ce fait, l'un des objectifs de la SAA, telle que la décrit Carolan, est de comprendre la «biographie» des denrées en suivant leur parcours à travers chacun des maillons de la chaîne alimentaire. Écrit d'une manière claire et conçu comme une introduction pour les étudiant(es), le livre permet de voir l'étendue du champ de la SAA, de saisir son évolution, de cerner ses objets et de se familiariser avec les approches méthodologiques et les enjeux auxquels elle fait face. Dans une visée didactique, chaque chapitre contient une liste de sujets et de mots-clefs pour s'y repérer rapidement, des textes suggérés selon le niveau du lecteur ou de la lectrice afin d'approfondir les thématiques présentées, des questions à discuter en groupe et de nombreuses références qui ont été actualisées pour cette nouvelle parution.

Le livre est divisé en quatre parties qui regroupent une quantité impressionnante d'études de cas faisant état des plus récents résultats de travaux de recherche en sciences sociales (dont la grande majorité provient somme toute des États-Unis et de quelques pays d'Europe). Le parcours que propose l'auteur à travers cette littérature prend deux formes. Ainsi, les trois premières

[1] English version to follow

*Corresponding author: srondeau049@uottawa.ca
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portions de l'ouvrage s'organisent selon une sociologie critique très bien documentée du système alimentaire industriel. Le livre en vient ensuite, dans une quatrième partie, à un exposé des perspectives d'avenir où sont présentées de manière tout aussi critique un petit nombre d'alternatives à ce système.

La première section du livre traite de l'économie globale de l'alimentation. Carolan se penche tout d'abord sur les transformations de la structure de l'agriculture et du système alimentaire dans les régimes capitalistes. L'auteur y présente quelques-uns des changements qui ont touché les petites exploitations familiales depuis environ 200 ans, de la mécanisation jusqu'à leur intégration dans des marchés mondiaux de plus en plus concentrés. Carolan examine ensuite quelques-unes des conséquences du bond technologique et scientifique qu'a subi l'agriculture durant cette période qu'on appelle la «révolution verte»: accroissement des inégalités sociales, épidémies d'obésité, exode rural, famines et problèmes de santé publique. Ces derniers sont entre autres dus, selon lui, au déficit en micronutriments d'espèces ayant été sélectionnées pour leur haut rendement. La section qui clôt la première partie de l'ouvrage est propre à cette édition et se concentre sur l'impact, sur les communautés, de la financiarisation de l'agriculture et de l'alimentation.

Pour la partie qui suit, Carolan resserre la focale. Il passe en effet des éléments structuraux du système alimentaire aux personnes et aux groupes qui s'y insèrent. L'auteur commence par rendre compte d'études qui s'inscrivent dans la tradition de celles de l'anthropologue Walter Goldschimd: les résultats de plusieurs décennies de recherches indiquent que l'organisation sociale qui accompagne le modèle industriel de production alimentaire a un effet négatif sur le bien-être socioéconomique, le tissu social et l'environnement des communautés rurales. Carolan aborde ensuite les conditions de travail dans la chaîne alimentaire. Il souligne alors, tout particulièrement, les inégalités salariales, basées sur l'ethnicité et le genre des travailleurs et travailleuses. Après quoi, l'auteur s'intéresse à la culture et aux savoirs en montrant notamment que la séparation progressive des populations humaines et animales, tout au long du XIX^{e} et du XX^{e} siècle, a complètement bouleversé les perceptions de la nourriture, et surtout celles des aliments carnés. La section suivante, elle aussi un apport nouveau à la présente édition, s'articule autour des théorisations du genre et de l'ethnicité et/ou de la race en SAA, tant au niveau de la production que de la consommation alimentaire.

Mais comment peut-on se nourrir sans porter atteinte à l'environnement et aux groupements d'humains qui y vivent ? L'une des pistes de solution explorées par Carolan, dans la troisième partie de son livre, est l'agroécologie, c'est-à-dire une façon alternative de penser les agroécosystèmes qui relie écologie, culture, économie et société. Après s'y être attardé, l'auteur décrit deux méthodes, leurs résultats et leurs limites pour étudier l'empreinte écologique des aliments: les miles alimentaires et l'analyse du cycle de vie. Malgré leurs divergences, les deux démarches proposées en viennent sensiblement à la même conclusion: le prix de la nourriture produite industriellement ne reflète pas les externalités du système alimentaire sur l'environnement et les sociétés. Également un ajout, le chapitre suivant, «Food security and food

sovereignty» donne un aperçu historique et critique des concepts de sécurité et de souveraineté alimentaires dont il est question tout au long de l'ouvrage.

Puis, la quatrième et dernière partie du livre appréhende un futur agroalimentaire plus juste et durable. Carolan y retrace, entre autres, les origines de l'agriculture biologique. L'auteur revient ainsi sur des enquêtes qui analysent les motivations et les parcours de vie des agriculteurs et des agricultrices en question et des consommateurs de leurs produits. Certaines idées reçues sont ainsi remises en cause par les études que présente Carolan, notamment celle d'une corrélation statistique entre le fait d'avoir un revenu élevé et de consommer des aliments biologiques; ou bien celle d'une production locale qui serait intrinsèquement meilleure pour l'environnement et les sociétés alors que la proximité géographique n'est pas garante de rapports plus justes entre humains et non humains.

Enfin, la synthèse que fait Carolan de l'état actuel des connaissances en SAA est remarquable et stimulante à lire. Au final, l'objectif pédagogique est bien rempli. En parcourant autant de sujets et de problématiques de manière non réductrice, le livre—et c'est probablement sa plus grande réussite—donne envie de poursuivre le travail des chercheurs et chercheuses en SAA.

Serge-Olivier Rondeau
Candidat au doctorat à l'École d'études sociologiques et anthropologiques de l'Université d'Ottawa

"Is anything as simultaneously familiar and distant as food" (p. 1)? asks Michael Carolan—professor of sociology at Colorado State University and author of numerous works in the field of the Sociology of Food and Agriculture (SFA)—at the opening of this book. Originally published in 2012, this second edition was published in February 2016. In "high-income countries", supermarket aisles replace most people's daily involvement in agricultural activity, even the basic experience of seeing the crops and smelling the livestock. In this context, specific to a handful of countries, the trajectories of food to grocery stores are particularly difficult to trace. Based on this fact, one of the objectives of the SFA, as described by the author, is to understand the "biography" of foodstuffs by following their journey through each link in the food chain. Clearly and carefully written and designed as an introduction for students, the book offers readers an overview of the field of SFA: its evolution, its central preoccupations, its methodologies and the challenges that cut across it. For educational purposes, each chapter contains a list of subjects and keywords for quick reference, texts suggested according to the level of the reader in order to deepen the themes presented, questions for group discussions and, in this new edition, many references which have been updated.

The book is divided into four sections, which include an impressive number of case studies reporting on the most recent results of research work in the social sciences (the vast majority of which come from the United States and a few European countries). The first three

sections function as a critical sociology of the industrial food system while the last contemplates future perspectives, where a selection of alternatives to this system are critically explored. Section one of the book attends to the global food economy. Carolan looks at structural changes to agriculture and the food system in capitalist and, more recently, neoliberal regimes. He begins by tracing the developments, from mechanization to their entry into increasingly concentrated global markets, that have affected small family farms over the past 200 years. Carolan then examines some of the consequences of the technological and scientific leaps in agriculture during this period called the "green revolution": increasing social inequalities, epidemics of obesity, rural exodus, famines, and health problems due to micronutrient deficiencies in certain species selected for their high yield. The close of this first section of the book, exclusive to this edition, elucidates the effects of these changes by focusing on the financialization of agriculture and food and its impacts on communities.

In the section that follows Carolan narrows his focus from the structural elements of the food system to the people and groups that fit into it. The author begins by reporting on studies that follow the tradition of Walter Goldschmidt, whose results of several decades of research indicate that the social organization that accompanies the industrial model of food production has a negative effect on the socioeconomic well-being, social fabric, and environment of rural communities. Then he discusses the working conditions of the agricultural workforce and the food chain, in particular highlighting wage inequalities based on ethnicity and gender. Carolan is equally interested in the construction of food culture and food knowledge and demonstrates that the gradual separation of human and animal populations throughout the 19th and 20th centuries completely changed perceptions of food, particularly meat-based foods. The section that follows, also a new addition to this edition, revolves around theories of gender and ethnicity/race in SFA, both in terms of production and consumption of food.

How can we eat without adversely affecting the environment and the groups that live in it? One of the possible solutions explored by Carolan in the third part of the book is agroecology, an alternative way of thinking about agroecosystems that links ecology, culture, economy, and society. The author then describes two methods, their results and their limitations for studying the ecological footprint of food: food miles and life cycle analysis. Despite their differences the two approaches come to essentially the same conclusion: the price of industrially produced food does not reflect the externalities of the food system on society and the environment. New in this edition, the subsequent chapter "Food security and food sovereignty" gives a historical and critical overview of the concepts of food security and food sovereignty that are used throughout the book.

In the fourth and last section of the book, which looks at a fairer and more sustainable agrifood future, Carolan traces, among other things, the origins of organic farming. The author returns to surveys that analyze the motivations and lifecourse of these farmers and the consumers of their products. Two myths are thus debunked. First, the correlation between having a high income and buying organic food. Second, the notion that local production is intrinsically better for the environment and society, a fact that is not supported by the studies he presents.

Finally, while it is sometimes difficult to understand the links between the book sections—for instance, certain themes raised in different chapters would have benefited from being grouped together (the conventionalization of organic farming is touched on in the first pages while organic farming only appears in the last chapter)—Carolan's synthesis of the current state of knowledge in SFA is remarkable and stimulating to read. The educational objective has certainly been met. Covering an impressive variety of subjects and issues in a comprehensive way, the book—perhaps Carolan's greatest contribution to the field—makes one want to continue the work of researchers in SFA.

Serge-Olivier Rondeau is a doctoral candidate at the School of Sociological and Anthropological Studies at The University of Ottawa.

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Film Review

The superfood chain

Directed by Ann Shin
Fathom Film Group, 2018, 66 min.
[available for streaming on TVO.org, with supplementary materials at www.thesuperfoodchain.com]

Review by Fabiana Li

From supermarket shelves to social media, superfoods make a frequent appearance in today's food landscape, even as the meaning of the term—and the health claims attached to it—are often unclear[1]. The ubiquity of superfoods could indicate a greater level of health-consciousness in today's society; more likely, this interest in 'health food' has been partly shaped by (and in turn fuels) the food industry's efforts to sell us new products. Increasingly, however, people want to know more about what they put on their plates: where do these foods come from, who produced them, and under what conditions? These are some of the questions that are explored in the documentary film *The Superfood Chain*, directed by Ann Shin.

Shin's interest in the topic was sparked by her role as a parent and her desire to learn about the best foods to nourish her family, which sometimes meant getting swept up by the latest superfood trend. The proliferation of superfoods may be attributed to the confusion and anxiety around food choices that results from too much information; from alarmist newspaper headlines linking food and health, to celebrity diets and cookbooks, we are constantly exposed to a cacophony of 'expert' advice about which foods to choose or avoid. It is in this environment that superfoods thrive, and even if most people recognize that the key to health is more elusive than

[1] Superfood is a non-medical marketing term used to describe food with a high content of antioxidants, minerals, or other nutrients that are associated with desirable health outcomes.

*Corresponding author: fabiana.li@umanitoba.ca
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savvy marketing might lead us to believe, this has not slowed the demand for products like quinoa, coconuts, teff, and wild salmon. These are the main products that Shin follows as she travels to meet quinoa farmers in Bolivia, teff growers in Ethiopia, members of a community producing coconut oil in the Philippines, and Haida Gwaii fisherfolk off the north coast of British Columbia. The questions that drive the documentary are: What consequences has the superfood craze had on their diets and livelihoods? Have they benefited from the increased demand for these foods? And what can we, as consumers, do to promote more sustainable food systems?

The ubiquity of quinoa—a South American crop prized for its nutritional content—has become a classic example (and cautionary tale) illustrating effects of the globalization of food. Through my current research on quinoa, I have observed some of the dynamics that are described in the film: the increased demand for quinoa internationally, the rise and drop in prices, and the mixed results experienced by families in traditional quinoa-growing communities in the Andes. The film shows that farmers who depend on cash crops are susceptible to boom and bust cycles and must continuously adapt to the whims of global consumers. While health-conscious 'foodies' may be partly responsible for its growing popularity, interest in quinoa extends to agricultural researchers and international organizations such as the United Nations, which designated 2013 the "International Year of Quinoa." For experts researching and promoting its production and consumption, quinoa holds promise in the fight against global food insecurity and climate change. Canada, the United States, Spain, and China are only some of the many countries where quinoa is now grown, and it could one day be produced at a lower cost in places far from the Lake Titicaca region where it originates. Like other media coverage of the quinoa boom, the film risks overdetermining a cause-and-effect relationship between consumers in the global North and farmers who grow their food. However, it is not possible in a short documentary to fully explore the intricacies of the international quinoa market and the ongoing transformation of local diets and agricultural systems.

What is clear is that the profits to be made from quinoa's global spread do not always reach the communities that have traditionally depended on it, and it is not easy to envision an alternative model that could benefit farmers more directly. In search of answers, Shin turns to Fair Trade as a possibility, using the example of coconut oil. In the community in the Philippines profiled in the film, a Fair Trade organization enabled families to gain control over the production of coconut oil, benefit from new equipment and a processing facility, and earn higher prices for their product. The story provides an unequivocal endorsement of Fair Trade, but this leaves out the challenges that often accompany such initiatives. While it may seem like a win-win proposition, Fair Trade does not always benefit the poorest growers who need it most (due to the cost of certification, for example), nor does it address the root causes of poverty. Regardless, the story told in the film gives viewers the sense that for a small extra cost, they can directly help and empower producers.

Conscious consumerism provides an overly simplified answer to the problems brought about by the global popularity of certain crops, but the film does touch on some structural

factors, such as government policies to safeguard food sovereignty and food security. In the case of teff, the Ethiopian government sought to prioritize local consumption of this grain, which is an integral part of the diet, by limiting its export to prevent prices from skyrocketing. Closer to home in Canada, the film's focus on wild salmon emphasizes the importance of Indigenous food sovereignty. In this case, it is about the Haida's sovereign right to food in spite of pressure from commercial fisheries. The value of the documentary is that it aims to expand the narrow nutritional focus of superfoods to include the social and ecological repercussions of what we eat. As Shin states in the narration, this film is not just about food: "It's about farmers and their sovereign right to grow and sell their own cultural crops."

In today's food scene, superfoods are taken out of context, disaggregated into a series of vitamins and minerals, and disconnected from the cultures and ways of life that gave us these products in the first place. The film aims to reconnect these foods with the people who grow, harvest, fish, and depend on them, showing the viewer the rhythm of the agricultural cycle, traditional food practices, and the joys and hardships of everyday life. Significantly, there is a focus on children throughout the film—their contributions to the household economy, their education (in school and on the land), and their future aspirations. The filmmaker's focus on children may signal change and hope for the future, and also makes the documentary suitable as a teaching tool and to encourage conversations with a younger audience.

The Superfood Chain can spark fruitful conversations about where our food comes from. The film urges viewers to think more deeply about their food and implies that by doing so, they can choose more wisely (seeing beyond the marketing hype, choosing Fair Trade, and opting for local foods that might provide benefits similar to the supposed superfoods). The risk is that the conversation ends with the idea that political action equates with ethical consumption (what Guthman (2007, p. 264) calls a "neoliberal anti-politics" that focuses on dietary choices and self-discipline rather than structural inequality and food policies). In spite of its focus on North American consumer habits, the film tries to push the viewer into a more nuanced response, and is most effective when it shifts the focus to the lives of people who depend on the foods that global consumers now covet. This glimpse into local communities suggests that what is needed is not individual but collective action, and a profound transformation of our global food system to ensure food security, food sovereignty, and long-term sustainability.

Fabiana Li is a cultural anthropologist whose research, teaching, and writing focuses on food, agriculture, the environment, and social movements. She is an Associate Professor of Anthropology at the University of Manitoba.

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