

“Making sense of the holistic why:”

Implementation of sustainable food in healthcare institutions in Ontario, Canada

by

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Author's Declaration

This thesis consists of material all of which I authored or co-authored: see Statement of Contributions included in the thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners. I understand that my thesis may be made electronically available to the public.

Statement of Contributions

This thesis consists in part of one manuscript that has been prepared for publication. Exceptions to sole authorship include:

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As the lead author, in collaboration with my co-authors, I conceived and designed the study, conducted data collection, analysis, and interpretation, and drafted the manuscript. My co-authors provided guidance throughout each step of the research process and provided feedback on draft manuscripts, with significant editorial contributions from my supervisor, Dr. Sharon Kirkpatrick.

Under Dr. Sharon Kirkpatrick's supervision, I prepared the remaining chapters in the thesis, which were not written for publication.

Abstract

Background

Health and food systems have deleterious consequences for planetary health. Health systems are responsible for between 4% and 8% of individual countries' greenhouse gas emissions worldwide, contributing to climate change. Yet, health system emissions not only contribute to warming temperatures but also to poor air and water quality, with cascading effects on health. An estimated 25% of global emissions are attributable to food systems through direct emissions and land clearing, while producing significant waste and pollutants, including fertilizers, pesticides, and plastic packaging.

Food systems are also associated with diet-related chronic diseases, leading to increased need for health services and high health costs. Paradoxically, health and food systems not only contribute to environmental change but are also directly impacted by its effects. Environmental change is predicted to increase burdens on health services, while reducing the nutrient quality of agricultural crops. Experts have called for transformations toward more sustainable health and food systems to address the multidimensional impacts on planetary health and increase resilience to future challenges.

Foodservice within healthcare institutions is a leverage point for instigating such transformations. Sustainable foodservice would contribute to improving nutrition and health, minimizing environmental impacts, strengthening cultural inclusivity, and promoting local sustainable food systems. Healthcare institutions have begun implementing sustainable food interventions. Yet, progress is small and variable, especially in Canada. The complexity of the healthcare environment creates unique considerations for changing practices. Research on practice change, sustainability, and sustainable food in healthcare indicates multiple barriers and facilitators. There are gaps in understanding the specific factors at play across individual, institutional, and community levels; different political and social contexts; and varying stages of sustainable food implementation, as well as the interactions between different actors and foodservice options within the institutional food environment.

Objectives

This thesis aimed to 1) explore the barriers and facilitators to sustainable food interventions in the foodservice of an exemplar healthcare institution in Ontario, Canada, and 2) compare barriers and facilitators to two additional institutions at different stages of sustainable food implementation.

Methodology

The design of this thesis was informed by a critical research paradigm guided by my philosophical assumptions, which value planetary health as the well-being of the whole system, acknowledging that the worth of non-humans is not relative to humans. The thesis was informed by systems science, implementation science, and social science, which contributed to developing a theoretical framework merging the Consolidated Framework for Implementation Research with Institutional Theory, guiding data collection, analysis, and interpretation.

I set out to conduct a collective case study of three healthcare institutions in Ontario, Canada, each in different stages of sustainable food implementation: an exemplar institution with multiple sustainable food interventions, a comparative institution with some evidence toward sustainable food, and a second comparative institution with less evidence toward sustainable food. I conducted ten semi-structured interviews with eight participants predominantly working in foodservice. Interviews were complemented by review of 47 documents, including strategic plans and sustainability reports, pertaining to the three institutions. Data were analyzed by institution and across institutions using a systems-based approach and a six-stage framework analysis method.

Results

Six conceptual themes, including efficiency meets sustainability, making sense of sustainable food, making sense through change management, development from the bottom-up, *“the patient voice is at the center of what we do,”* and a disconnected food environment, were generated. Themes were mapped to the theoretical framework, highlighting that implementation of sustainable food interventions cuts across all domains of the Consolidated Framework for Implementation Research, and is influenced by multiple pillars of Institutional Theory. The strongest barriers originated from the regulative pillar of Institutional Theory, and the strongest facilitators stemmed from the cultural-cognitive pillar of Institutional Theory. However, barriers and facilitators interacted with one another in complex ways. External partnerships and staff and visitor food options were identified as promising for expanding implementation and potentially weakening negative feedback channels maintaining efficient systems, particularly patient preferences that conflicted with sustainable menus. Accreditation standards incorporating sustainable food indicators were deemed a promising policy direction by participants, with the potential to weaken negative feedback channels by combining normative, cultural-cognitive, and regulative pillars of Institutional Theory to promote change.

Conclusions

Though there was some alignment with barriers and facilitators identified in prior research, the application of a systems lens in this research identified how barriers and facilitators interacted and seemed to combine into negative and positive feedback channels in a dynamic process, either constraining or reinforcing change toward sustainable food interventions. The findings provide insights into the institutions and individuals slowly shifting norms that dictate everyday practice in healthcare foodservice necessary to move toward sustainable health and food systems that address the negative consequences of such systems for planetary health.

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List of Abbreviations

CFIR Consolidated Framework for Implementation Research

GPO Group purchasing organization

NPT Normalization Process Theory

UK United Kingdom

NHS National Health Service

US United States

Chapter 1

Introduction

1.1 Overview and scope

The World Health Organization defines a health system as “the organizations, institutions and resources whose primary purpose is to improve health.”^{1, p.xi} This broad definition encompasses the delivery of care, from prevention to palliation, within primary, specialty, community, hospital, and long-term care settings.^{2,3} It also includes the necessary infrastructure and resources, including energy, water, supply chains, and human resources, to deliver that care. Food systems comprise the production, processing, distribution, sale, consumption, and disposal of food products from agriculture, livestock, forestry, and fisheries, as well as the necessary actors, activities, environments, and resources.⁴⁻⁶

Health and food systems have significant consequences for planetary health.⁶⁻¹¹ The environmental, health, economic and social impacts have led to calls for transformations to more sustainable systems.^{9,11-15} There are myriad definitions of a sustainable system, dependent on the disciplinary lens and philosophical assumptions. Within this thesis, sustainable systems are defined as those that equitably deliver intended benefits without compromising the ability to continue delivering those benefits in the future.¹⁶⁻¹⁸ Sustainable systems involve conserving and protecting environmental and human resources, centring justice to meet the needs of all humans and the planet, and focusing on long-term time horizons.^{3,6,16,19,20}

Sustainable food in healthcare institutions is a leverage point for instigating transformations to more sustainable health and food systems.²¹⁻²⁵ According to the Food and Agriculture Organization, sustainable foods are those with “low environmental impacts... (that) contribute to food and nutrition security and to healthy life for present and future generations..., (are) protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable;

nutritionally adequate, safe and healthy; while optimizing natural and human resources.”²⁶ Yet, progress in integrating sustainable food into the food procurement and provisioning programs (foodservice) in healthcare institutions in Canada has been small and variable.^{21,27,28} This thesis explores barriers and facilitators to sustainable food interventions in the foodservice of an exemplar healthcare institution in Ontario, Canada, and compares barriers and facilitators to two additional Ontario institutions at different stages of sustainable food implementation.

1.2 Thesis organization

Chapter 2 describes the context of health and food systems and why sustainable food in healthcare institutions is a leverage point. It outlines the extent of prior research in this field, providing the research rationale and objectives. Chapter 3 describes how my positionality, axiology, and philosophical assumptions shape this research, before outlining the theoretical framework in Chapter 4. Chapter 5 contains a manuscript prepared for publication detailing the study methodology, results, and discussion. I reflect on the experience of conducting this thesis and offer a summary of its contributions in Chapter 6. The Appendices contain study documents, including the initial interview guide, letter of information, consent forms, reflexive field note template, and letter of appreciation.

Chapter 2

Context

2.1 Health systems

Health systems have significant consequences for planetary health across environmental, health, economic and social dimensions. Health systems are responsible for between 4% and 8% of individual countries' greenhouse gas emissions worldwide, contributing to climate change.¹¹ An estimated 5% of Canada's emissions originate from healthcare.⁷ Direct and indirect emissions occur from myriad sources, including anesthetic gases, imaging technologies, and pharmaceuticals; however, over half of the emissions are attributable to hospital supply chains.^{11,25,29,30} The World Health Organization has advocated for a transition to low-carbon and climate-resilient health systems in response to the climate emergency and has created a global agreement to which 99 countries, including Canada, have committed.³¹

Scholars in sustainability science, ethics, and public health advocate expanding the World Health Organization's framework beyond the impacts on climate change, pointing to the conflict between the mandate of health systems to promote and protect health and the various environmental and subsequent health, economic, and social harms of health services.^{14,15,32–36} The effects of greenhouse gas emissions have significant consequences for physical and mental health, such as respiratory and cardiac illnesses from wildfires and extreme heat, and mental health challenges from climate events and environmental change.^{15,20,37} Health system emissions not only contribute to warming temperatures but also to poor air quality, both of which contribute to respiratory and cardiac diseases.^{11,15,37} Equally important, healthcare waste contaminates the air and water, leading to algal blooms and microplastic pollution, with cascading effects on health.^{15,25,37}

Paradoxically, healthcare institutions not only contribute to climate change but are also directly impacted by its effects and overburdened with treating the physical and mental health consequences.

Since 2014, heat emergencies, wildfires, and heavy rainfall attributable to climate change have led to infrastructure failures, patient transfers, and closures in healthcare institutions across Canada.³⁷

Economic, health, and social costs have resulted from reduced access to health services and the toll on healthcare workers.³⁷ Chronic diseases, such as cardiovascular disease, partly stemming from climate change and poor air quality, are the leading cause of hospitalizations in Ontario, costing the healthcare system \$10.5 billion in 2010.³⁸ Reducing the “pernicious cycle of harm, treat and harm”^{3, p.11} would help reduce the economic and social burden on health services.

Evidence has furthermore demonstrated diminishing marginal returns from healthcare expenditures, suggesting that above a threshold, the investment in and intensity of health services do not provide equal value in terms of health improvements.^{20,27} As health services, emissions, and waste increase, there is a significant improvement in health outcomes, such as those seen in low and middle-income countries.³⁹ However, past a threshold of services, emissions, and waste, such as within high-income countries, there are not only limited improvements in health outcomes but also negative impacts, such as contributions to poor air quality previously discussed that increase risk of cardiovascular disease.³⁹ This observation raises social justice concerns. Health systems in high-income countries produce emissions and waste that do not provide value, while additional health services are urgently needed in low-income countries to adequately protect and promote health. Moreover, low-income countries are disproportionately affected by the emissions and waste of high-income countries, exacerbating the injustice and suggesting that high-income countries, such as Canada, must lead by immediately reducing health services that do not contribute to improving health outcomes (low-value care) and the resulting emissions and waste.^{33,34,39}

Health system experts emphasize that the most significant way of reducing low-value care and the accompanying environmental, health, economic, and social consequences is by preventing ill health and reducing the need for health services.^{14,32,33} Emphasizing preventative measures would also improve

overall well-being and productivity, leading to health, economic, and social benefits.¹⁴ Climate experts similarly emphasize implementing measures that both mitigate and adapt to climate change by reducing emissions and the resultant consequences, and instituting interventions that enhance resilience to the future effects of climate change, reducing further negative consequences.^{15,37}

2.2 Food systems

Nutrition is a key determinant of overall health and well-being, contributing to the prevention of ill health and the need for healthcare services.⁶ Not meeting dietary guidelines cost an estimated \$13.8 billion in direct and indirect healthcare costs in Canada in 2014.⁴⁰ Unhealthy eating is estimated to cost \$5.6 billion annually in Ontario, with \$1.8 billion attributed to inadequate consumption of vegetables and fruits.³⁸ The most prevalent dietary pattern in North America, characterized by high amounts of meat, dairy, and processed foods,^{41,42} is associated with diet-related chronic diseases, such as diabetes, cardiovascular disease, and cancers.^{43,44} As evidenced during the COVID-19 pandemic, those with pre-existing diet-related chronic diseases, malnutrition, or food insecurity were at higher risk of contracting COVID-19 and at higher risk of more severe disease and complications.⁴⁵ Adequate nutrition and improved health can likewise strengthen resilience to events such as wildfires, extreme heat, and vector-borne diseases, as well as the potential downstream impacts of power and food supply chain disruptions.³⁷ Nutrition also contributes to healthy aging, higher educational attainment, and productivity, factors that contribute to stronger resilience and lower need for health services.³⁸

There are many parallels between the health and food systems with respect to environmental, health, economic, and social impacts. Food systems contribute to and are affected by environmental challenges such as climate change.^{8,46} An estimated 25% of global emissions are attributable to food systems through direct emissions and land clearing, while producing significant waste and pollutants, including fertilizers, pesticides, and plastic packaging.^{6,8,10,47,48} Production and consumption of animal-

based food products, such as red meat and dairy, are the primary drivers of environmental impacts.^{6,8,43,44} Such impacts are predicted to increase by 50 to 92% by 2050.⁸ Industrial-scale livestock farming is associated with additional environmental and health challenges, such as antimicrobial resistance and the spread of zoonotic diseases.^{10,35} Concurrently, the effects of climate change are predicted to reduce food production and the nutrient quality of important crops, while increasing prices, food insecurity, and malnutrition.^{15,46,49}

Like health systems, food systems raise ethical issues stemming from the commodification of food, industrial-scale production, and global trade. Despite the recognition of food as a human right,⁵⁰ affordability remains a challenge for many. In 2024, 26% of the population in Ontario lived in food-insecure households.⁵¹ The most affordable foods are those with the most significant environmental and health consequences due to externalized prices—the ticket price does not include the downstream consequences—perpetuating structural health inequities.^{10,23,44} Global trade rewards multinational corporations over small-scale food producers and encourages poor working conditions and low pay for migrant workers.⁵² The resulting food insecurity, malnutrition, and health consequences stemming from such ethical challenges increase the overall need for health services.

Mirroring the calls for more sustainable health systems, experts have called for a transformation of the food system to more sustainable production and consumption patterns to address the multidimensional impacts on planetary health and increase resilience to future challenges.^{6,10,12,13,26,43,53,54}

2.3 Healthcare foodservice

Foodservice within healthcare institutions encompasses the procurement and provisioning of food for patients, institutional staff, volunteers, students, and visitors, which includes patient families, outpatients, and emergency department visitors. Foodservice is currently not viewed as an essential

function within healthcare institutions.^{55–59} The majority of food is ordered from external manufacturers, prepared off-site, and reheated before service to improve efficiency and save short-term costs.^{58,60–63} Some institutions have returned to in-house production of fresh food to improve quality and patient satisfaction.^{57,58} However, according to a 2012 survey of foodservice managers in 38 hospitals in Ontario, their top concern was budget.⁶² Some institutions pool their financial resources to source supplies, including food, from Group Purchasing Organizations (GPOs), which provide lower prices.⁶⁴ There are several national GPOs operating in Ontario, including HealthPRO, and one regional GPO, MEALSource, which serves over 30 healthcare service locations.⁶³ Procured food must be available in large quantities, pre-washed, and portioned,^{65,66} as most institutions have reduced their kitchen infrastructure in response to decreased foodservice funding and staff.⁵⁸ The 2012 survey of foodservice managers in 38 hospitals in Ontario reported that only 7% of fresh vegetables and no meat/poultry served were sourced from local food producers.⁶² Conversely, 65% of fresh vegetables and 77% of meat/poultry served were sourced from a broadline distributor (wholesale supplier of a range of food items from multiple food producers), such as Sysco or Gordon Food Service, which may or may not be from local producers. Foodservice to staff and visitors is cafeteria or restaurant-style, usually provided by external food vendors operating on a for-profit model.^{61,62} The availability and affordability of healthy, sustainable foods impact employee health and wellness,^{67,68} while also having ripple effects on the local economy and population health.^{66,69}

Research has highlighted the need to instill the value of food and nutrition into healthcare institutions to improve health outcomes for patients and staff, reduce the burden on healthcare resources, and save long-term costs.^{55,57,61,67,70} Food is not ancillary to healthcare delivery, nor is focusing scarce resources on foodservice antithetical to effective healthcare delivery.^{55,71} Foodservice contributes a significant portion of an institution's environmental footprint.²⁵ In a German study, foodservice contributed 17% of an institution's total environmental footprint from direct institutional sources and

indirect emissions from the production, manufacture, and transportation of food across the supply chain.²⁵ Furthermore, food waste is a significant issue. Lalande et al.⁶¹ reported that 38% of food served on a surgical unit in a Canadian hospital was wasted over the two-week study period. Approximately 20% to 30% of an institution's overall waste originates from foodservice.²¹ Food disposed of in landfills emits methane, a greenhouse gas 25 times more potent than carbon, the most widely discussed greenhouse gas.⁷² Food waste also has ethical implications, given rates of food insecurity, as well as financial costs to the institution for disposal.^{61,73} The cultural inclusivity of menu options has further social implications for equity.^{58,62} Patient food options can be adapted to preferences, using ordering systems ranging from paper, verbal, and digital models. However, the large number of meals served and the infrequency with which menus are changed are limitations to possible alterations.^{58,62}

Transitioning to sustainable foodservice would contribute to improving nutrition and preventing and managing chronic diseases for a large segment of the population, from patients and their families, to staff, volunteers, and students, and the surrounding local communities.^{21,22,61,65,67,71,74,75} Preventing and managing chronic disease improves population resilience to future events such as infectious disease outbreaks, wildfires, and extreme heat,^{15,37,46} minimizing downstream strain on healthcare services.^{21,22,69,71} Transitioning to sustainable food would minimize environmental impacts through reduced emissions and waste, and help address the call for low-carbon, climate-resilient health systems.^{21,22,61,65,71,74} Sustainable foods, including plant-based foods that are Halal and Kosher, can furthermore improve cultural inclusivity.^{71,74}

As large public institutions that employ approximately one million people in Canada⁷⁶ and procure significant amounts of goods and services, healthcare institutions have the opportunity to become anchor institutions.^{69,77–79} Anchor institutions leverage their ethical, economic, and political influence to strengthen community health and wellness, recognizing that health and wellness depend on the environments in which we live.^{80,81} Anchor institutions embrace their role as enduring pillars of their

communities by investing, engaging, and collaborating with surrounding communities to address the root causes of poor health.^{80–82} Canadian healthcare institutions serve 250,000 patient meals per day, at a total annual cost of \$4 billion,^{83,84} figures that do not account for food served to staff, volunteers, or visitors. Leveraging this purchasing power would strengthen local food systems by supporting local food producers, incentivizing the production of sustainable food, and increasing its availability and long-term affordability.^{10,22,66,69}

Food is a critical upstream determinant of health that should be harnessed by a public institution mandated to promote and protect health.^{21,22,69,71} Yet, healthcare institutions contribute to the problems leading to disease and poor health, creating ethical and moral considerations. Failing to serve health-promoting food within healthcare institutions contradicts the codes of ethics of healthcare professionals.^{3,14,36} While most healthcare professionals do not directly control food menus, they do have an opportunity to advocate and collaborate with those who do. Many healthcare professionals across diverse roles have acknowledged their social duty to care not only for people, but for the planet as well, as evidenced in the many position papers calling for an expansion of their ethical responsibility.^{14,23,85–88} This duty has also been incorporated into the model of care in Catholic healthcare institutions.³

2.4 Action toward sustainable food in healthcare foodservice

Several countries have legislated shifts to more sustainable food within their healthcare services. The European Union's Farm to Fork Strategy aims to improve the health and environmental sustainability of foodservice in public institutions.⁷⁸ The National Health Service (NHS) in the United Kingdom (UK) has mandated healthcare institutions to develop Green Plans committing to how they will achieve net-zero carbon emissions by 2045.⁸⁹ Foodservice accounts for 6% of total emissions within NHS institutions, prompting guidelines for reducing meat and dairy and implementing plant-forward menus in the NHS England National Standards for Healthcare Food and Drink.⁸⁹ A 2025 study, however, found high amounts

of ruminant and processed meat and inadequate levels of plant-based dishes on the menus of a random sample of 34 NHS institutions,⁸⁹ despite studies in the global context that have found high levels of patient support for removing red meat from foodservice menus within healthcare institutions.^{90,91} In 2018, the Dutch government similarly legislated that all healthcare institutions must offer healthy food to patients, visitors, and staff by 2030 as part of its National Prevention Agreement to improve population health.⁶⁰ Part of this policy involves shifting from animal- to plant-based proteins by 2030.^{60,69}

Healthcare institutions in Ireland have transitioned to more sustainable procurement and waste practices using a framework that combines government regulations for compliance, dedicated staff roles, partnerships with NGOs and academia, and internal staff engagement.⁹² Institutions also leverage their position in the community to spread awareness of their sustainability interventions using media and educating the large number of students with placements in teaching hospitals.⁹² Institutions have restructured procurement contracts to require reduced packaging and local products, instituted regular waste audits, and transitioned to reusable cups.⁹² Patients are now offered the opportunity to choose portion sizes, condiments, and side dishes, as these were identified as waste hotspots.⁹² This progress occurred despite the identified challenges of limited implementation tools and financial resources, as well as the initial lack of staff engagement, stemming from a focus on patient health and safety that was already causing high workload demands.⁹² Ryan-Fogerty et al.⁹² credit success to an approach allowing collaboration among disparate stakeholders who usually work in silos, improving efficiency, innovation, and communication.

A 2021 study identified 14 global institutions leading the way in integrating sustainable food interventions within their foodservice, including three institutions from Australia, three from Canada, two from Taiwan, and one each from Denmark, the Netherlands, Singapore, the UK, and the United States (US).²² Interventions included on-site gardens, diverting food waste from landfill using composting

and organic digesters, shifting to plant-based proteins, sourcing local foods, donating leftover food, and reusing unopened items.²²

German healthcare institutions, however, have had limited progress in integrating sustainable food.⁹³ A 2025 study measured the dietary quality and environmental footprint of five German healthcare institutions, finding low dietary quality and a heavy environmental footprint due to meals high in animal-based products and unhealthy plant-based products, significant amounts of saturated fat and salt, and low amounts of dietary fibre and critical vitamins and minerals.⁹⁴ Sixty percent of the protein served was from animal-based products, contributing 75% of the environmental impact, while legumes represented only 1% of the food provided.⁹⁴

Healthcare Without Harm states that one-third of hospitals in the US have committed to addressing climate change by increasing plant-based and reducing animal-based foods, purchasing local foods, reducing food waste, and hosting farmers' markets.^{95,96} The American Medical Association and other major healthcare associations have called on healthcare institutions to offer fully plant-based meals to reduce diet-related chronic disease morbidity and mortality.^{75,97} Many institutions across several states have implemented fully plant-based menus and patient education programs to address cardiovascular disease, including 11 hospitals in New York City whose default menus are plant-based.^{61,90,97}

In Canada, healthcare institutions in British Columbia, Ontario, and Quebec have joined the Health Care Climate Challenge of Practice Greenhealth and Health Care Without Harm, pledging to transition to low-carbon, climate-resilient health systems.⁹⁸ Thirty-seven institutions have also signed the Coolfood Pledge of the World Resources Institute, committing to reducing the carbon footprint of their foodservice.⁹⁹ In 2021, the Canadian Coalition for Green Health Care identified 13 healthcare institutions across Canada with green teams, or groups of individuals volunteering for projects that aim to reduce

energy use, greenhouse gas emissions, and waste.¹⁰⁰ A 2025 study reported the experiences of individuals in 19 green teams across Canada, signalling increasing attention to more sustainable health practices in Canada.¹⁰¹ Despite such attention, a recent study in a large acute care hospital in Vancouver found that the food served was emission- and land-intensive, mostly attributable to animal-based proteins, which were the default option for all lunch and dinner meals.⁶¹ Furthermore, 38% of food served was wasted, and patient satisfaction scores for food were low.⁶¹ These findings align with Trinca et al.⁵⁸, who reported the perspectives of healthcare staff in 16 Ontario hospitals related to quality food in healthcare. This study, however, did not explicitly consider environmental sustainability. Similar research measuring the environmental outcomes of foodservice in other provinces in Canada has not been identified.

Healthcare institutions in Ontario are subject to a complex network of regulations across federal, provincial, and institutional levels, many of which are relevant to foodservice. The Public Hospitals Act,¹⁰² which prescribes the management and operation of healthcare institutions in Ontario, does not directly regulate foodservice. Each institution is authorized to make its own decisions regarding day-to-day operations, including with respect to foodservice.¹⁰² As public eating establishments, institutions are required to abide by food safety regulations under the Safe Food for Canadians Act¹⁰³ and the Food Premises Regulation of the Health Protection and Promotion Act in Ontario.¹⁰⁴ Institutions are required to have infection control standards dictating how food is prepared and served to limit the transmission of infectious diseases.¹⁰² Food procurement in public institutions in Ontario is also regulated by Bill 122, the Broader Public Sector Accountability Act, 2010. This Bill requires that any public funds used to procure goods and services are bound by the principles of accountability, transparency, value for money, and fairness.¹⁰⁵ The Bill sets out how food is procured, but does not stipulate what can or should be procured by healthcare institutions. The Local Food Act, 2013, encourages partnerships between public institutions and local food producers to promote the use of food produced or harvested in Ontario.¹⁰⁶

Two further regulations, the Building Ontario Businesses Initiative Act, 2022, and the Aspirational Goal for Broader Public Sector Local Food Procurement under the Local Food Act, 2012, were created to facilitate the procurement of Ontario goods by public institutions.^{107,108} There are no requirements, however, for healthcare institutions to procure local foods.^{106–108} Beyond these health and economic regulations, there are no legal requirements related to the environmental or social implications of foodservice in public institutions, nor are there specific food standards to abide by.⁶³ Health Canada's Healthy Eating Strategy currently does not dictate the food standards of healthcare institutions,¹⁰⁹ only recommending following Canada's food guide. Ontario does not have such a strategy.⁶³ As of 2014, the Ontario government requires public agencies, including healthcare institutions, to implement and publicly report on energy conservation and greenhouse gas emissions reduction plans.¹¹⁰ Although foodservice is included in this requirement, reporting is not disaggregated by department, lessening any incentive for foodservice to focus on its energy use and emissions.¹¹⁰

My grey literature scoping review of strategic plans and publicly available documents from 57 healthcare institutions in Ontario suggests that more action towards sustainable foodservice is needed.¹¹¹ A dozen institutions have made progress integrating food as medicine interventions, improving the cultural acceptability of food options, and reducing waste. However, progress is small and variable across the province. Most institutions had zero to three interventions, typically motivated by a single dimension of sustainability: environmental, health, economic, or social. Social and health benefits were the most common motivating factor, and interventions recommended for their documented potential to improve sustainability, such as increasing plant-based foods, decreasing animal-based products, and eliminating single-use plastics,⁸⁴ were underutilized.

2.5 Barriers and facilitators of practice change, sustainability, and sustainable food in healthcare institutions

A common thread through the literature is the complexity of the healthcare environment, which creates unique considerations for changing practices.^{3,22,60,61,64,78,112–115} Practice change was once thought to be a linear process of applying evidence, supported by staff training and audits, but the lack of success necessitated new models that account for the systemic nature of healthcare.¹¹⁶ Wierda et al.⁶⁰ stressed the importance of considering the physical, socio-cultural, political, and economic dimensions of healthcare, as they are interconnected and dynamic. Studies have emphasized the diverse array of actors, including patients, visitors, staff, students, and academics, who all contribute to and are affected by the food environment within the institution.^{60,92} Foodservice is characterized by a variety of provision options, both for profit and not, including inpatient service, cafeterias, external vendors, vending machines, and gift shops.⁶⁰ Prior studies have tended to focus on one group of stakeholders, one food provision model, or one food location in isolation, without considering the system of different actors and elements and how they interact.¹¹⁷

Research exploring barriers and facilitators to practice change in healthcare has found that changes in collective behaviour norms reinforced through education and follow-up are most successful.¹¹⁸ In Sweden, physicians and nurses reported that participation in intervention design and implementation, continuous communication, and direct benefits to providing care were key determinants of success.¹¹⁹ A systematic review from 2020 found that clearly delineating roles and responsibilities, ensuring leadership buy-in, and providing adequate resources were key facilitators of intervention success in healthcare.¹²⁰

Research investigating barriers and facilitators to sustainability in healthcare institutions from the UK, Ireland, and the Netherlands similarly suggests that engaging leadership and internal staff about

sustainability in healthcare is critical to mitigate concerns about impacts on patient care and to address workload pressures stemming from staff shortages and a lack of resources.^{60,69,92,117,121} New government policies related to sustainable healthcare in the UK, Ireland, and the Netherlands created widespread attention,⁶⁹ leading to collaboration with external stakeholders, restructured supply chain contracts, and staff willingness to champion interventions.¹¹⁷ Entrenched attitudes about the primary role of healthcare have been identified as a key barrier to sustainable food interventions, necessitating using the language of health to motivate participation in sustainable practices.¹²¹ Research from the Netherlands discussed the perception that hospitals should focus on treatment over prevention, and the belief that a few days of different food in hospital would not result in individual behaviour change or action within the broader food environment.¹¹⁷ Dutch authors identified a moral conflict, stemming from neoliberal norms favouring individual freedom of choice, about whether limiting food choices was paternalistic or a responsibility given healthcare's mandate to protect health.⁶⁰ The perceived salience of climate and environmental change acted to mitigate some of these concerns and motivate action, indicating the value of effective communication and framing.⁶⁹

Market forces also stemming from neoliberal norms emphasize efficiency, standardization, and affordability, and typically govern food procurement, encouraging the use of GPOs and broadline distributors.⁶⁴ As mentioned, contracts with GPOs and broadline distributors impact the sustainability of foodservice. However, such contracts also act as barriers to sustainable food interventions. For example, contracts stipulate the percentage of food that must be procured through these suppliers.^{64,115} If sustainable options are not available through the distributor, the institution is handcuffed.^{22,64,66,77,96} Authors have also argued that the values of environmental stewardship, social justice, and equity are not communicated across the industrial food supply chain, limiting the ability to define and locate products that align with values-based procurement.^{64,96} As mentioned, on-site kitchen space, equipment, and

staffing, as well as supportive elements such as partnerships and communication with food producers, have been reduced in recent decades, acting as barriers to sustainable food interventions.^{66,77}

Research from Australia, New Zealand, and the US has highlighted that foodservice models and standard practices act as barriers to sustainable food efforts.¹²² Inflexible, automated foodservice models that rely on standard choices and portion sizes make it challenging to accommodate patient preferences and changes in health status, impacting waste reduction efforts.¹²² The COVID-19 pandemic has had several implications for standard practices, including increased infection control standards and an emphasis on disposable plastics, which have acted as barriers to more sustainable food practices.^{22,22,77,96,122,123} Transitioning to more efficient ordering systems, such as room service models, was highlighted as a key facilitator for mitigating food waste.^{77,96,124} Perceived patient preferences are also barriers, limiting the willingness to shift to plant-based food options.^{71,96,125} Cultural preferences for meat and stigma around vegetarianism in Australia and New Zealand contributed to staff resistance and leadership fear over public backlash.^{71,125}

The lack of legislation regarding foodservice standards in healthcare in some countries, including Canada, adds further complexity to efforts to change practices.²² Research suggests that healthcare providers are assumed to be sufficiently knowledgeable about the importance of sustainability interventions, negating the need for direct financial benefits or regulations to incentivize change.⁹² This assumption, however, leaves institutions without the necessary motivation or resources to support implementation.^{77,92} Competing priorities, including quality patient care, safety, and staff burnout, draw attention away from sustainability, reducing the capacity to participate in sustainability interventions.⁷⁷ Bigger ticket items related to sustainability, such as energy use and pharmaceutical pollution, also draw attention away from sustainability in foodservice.⁷⁷

Studies documenting the successful integration of sustainable food interventions from the European Union and the US have highlighted the benefits of collaboration between institutions and local producers for overcoming resource shortages and high costs by pooling and streamlining efforts, such as through local food hubs.^{66,114,124} Collaboration has also extended to the community by marketing the benefits of more sustainable institutional foodservice.^{115,124} Institutions that have successfully implemented sustainable food practices report that dedicated personnel, hiring a knowledgeable chef, creating new recipes, initiating new partnerships, and expanding food procurement beyond GPO contracts have been key facilitators of these efforts.^{22,96,126} Conversely, some healthcare leadership and foodservice management cite the inability to procure large quantities at low prices as a barrier to using local, more sustainable foods.^{65,66,96,114,125} Managing multiple contracts with smaller, more local producers, the seasonality of local foods, and the higher perishability of produce needed for plant-based diets are also challenges.^{66,75,77,114}

Institutions that achieved greater success cited a cultural shift as a key facilitator. Rather than blaming resistance and the lack of external support as limiting factors, or aiming to add sustainable food to existing practice and workflow, successful institutions took initiative to change norms about the importance of food by empowering staff and patients and creating a supportive structure of internal policies, champions, and external networks to drive a foodservice program grounded in sustainability.^{22,115,126,127} Unlike institutions in the UK, Ireland, and the Netherlands, where government policies were catalysts, other successful institutions were not reliant on policymakers.¹¹⁵ More sustainable practices, such as plant-based diets and regular food waste audits, became standard practice.^{75,127} Marketing and media presence were leveraged to engage the community and other healthcare institutions.⁷⁷ The increase in costs was deemed acceptable given the external, downstream costs associated with environmental change, declining population health, and the growing healthcare burden.⁷⁵

The scarce peer-reviewed literature on barriers and facilitators in Canadian healthcare institutions has explored the perceptions of institutional staff regarding quality food provision in Ontario, as well as the opinions of foodservice managers and dietitians on sustainable food in Quebec. Similar to other countries, a culture valuing the importance of food was found to be lacking, compounded by reduced resources and staff, as well as existing GPO contracts.^{28,58,128,129} Little understanding of sustainable food and limited coordination across foodservice, front-line care, and dietetics were also barriers.^{28,128} Canadian research emphasized that policymakers must do more to create an enabling environment, including updates to regulations and increased resource allocation.^{28,128,129}

In addition to the paucity of Canadian research, the existing work on barriers and facilitators to sustainable foodservice has tended to be limited in scope. Authors have advocated for a more nuanced understanding of the specific factors across individual, institutional, and community levels,¹¹⁴ such as the type of leadership, education, and resources that have been most valuable to different actors.¹²³ There is a gap in understanding the interactions between different actors and varying foodservice models and locations within healthcare institutions. Authors have also noted the need for follow-up evaluation with those who have implemented interventions to investigate the validity of concerns about patient resistance and increasing food waste,⁷⁵ to document successes, and to share best practices across institutions.¹²⁶

Transitioning to sustainable foodservice within healthcare institutions is a key leverage point for mitigating the deleterious consequences of health and food systems for planetary health, and for moving toward more sustainable systems. Prior research has documented barriers and facilitators to action in international contexts. Yet, there are gaps in understanding the multidimensional factors at play across individual, institutional, and community levels, especially in Canada. Health is a provincial jurisdiction in Canada; therefore, each province has a specific context. Understanding the barriers and facilitators

unique to Ontario healthcare institutions would provide essential knowledge for transforming foodservice and the broader health and food systems in Ontario.

2.5 Research objectives

This thesis aims to 1) explore the barriers and facilitators to sustainable food interventions in the foodservice of an exemplar healthcare institution in Ontario, Canada, and 2) compare barriers and facilitators to two additional Ontario institutions at different stages of sustainable food implementation.

Chapter 3

Philosophical Approach

Positioning oneself in relation to the research topic is a critical first step in producing credible and trustworthy research.¹³⁰ Further, a transparent and consistent research paradigm offers structure and rigour.¹³¹ My critical research paradigm questions dominant understandings, offers a different definition of the problem, and aims to identify strategic interventions for structural change.^{131–135} Transparently describing how my positionality, axiology, ontology, and epistemology constitute my research paradigm is meant to provide the necessary context to understand why I have chosen this subject of inquiry, as well as the influences on methodology, data collection, analysis, and interpretation.¹³¹

3.1 Positionality

The researcher's identity is a central component of a critical research paradigm, as it assumes the researcher is a key actor interacting with participants and the research context to co-produce knowledge.^{131,136} My positionality is situated in multiple identities as a Gen Xer, nurse, woman, and public health and sustainability researcher, each of which is an important consideration related to this research topic. Being raised in the 1980s and 90s, an era of unbounded consumerism and anthropocentrism largely responsible for current challenges, has instilled a responsibility to do better. Coupled with now being in a developmental stage seeking generativity,¹³⁷ I have an unwavering commitment to encouraging others to do better.

As a nurse, I have managed the consequences of diet-related chronic diseases and observed the contradictory provision of food in healthcare institutions. A nursing duty of care and training to appreciate the whole system are deeply embedded in my identity.¹³⁸ I developed a deep empathy for the structural barriers to health and wellness as a bedside and community nurse. I recognize and am motivated to address the complex connections between challenges and their immediate and long-term

health implications. I am also keenly aware of the entrenched superiority of the medical profession^{139,140} and the importance of listening to often-silenced voices that offer alternative healthcare narratives.¹⁴¹ My public health training dictates preventative strategies to improve health, which challenge the normative role of healthcare institutions,^{139,142} while my sustainability training highlights the inequities with respect to climate change contributions and impacts. Canada has one of the highest per capita emissions rates globally.¹⁴³ Yet, the consequences of climate change will disproportionately impact those within Canada and globally with the lowest emissions rates.^{144,145} Addressing the social injustices and resulting inequities is important to me.

As someone with significant knowledge of the culture and operations in healthcare, I may be considered an “insider” conducting research in healthcare institutions.¹⁴⁶ I may be more likely to identify with participants' perspectives and establish trust, given we may have shared experiences.¹⁴⁶ However, my insider role may also inadvertently limit my consideration of diverging perspectives and potentially marginalize such voices.¹⁴⁶ Conversely, I have spent the last several years in education and research rather than working in healthcare, potentially making me an “outsider.” I may have lost touch with the imperatives within healthcare institutions, leading to a hypocritical stance that expects leadership from an overburdened sector.^{147,148} Nevertheless, I may have more emotional distance, allowing me to more effectively place healthcare within the broader context.¹⁴⁶ To respect my critical research paradigm, I will use field notes as a reflexive tool, allowing me to continue exploring my fluid location between “insider” and “outsider.”^{136,146,149}

My research is shaped by my privilege, crucial to recognize so as not to marginalize other voices. I am a white, middle-class, Canadian-born settler. Given the colonial atrocities perpetrated against Indigenous Peoples, I have committed to learning and working toward reconciliation. I have endeavoured not to marginalize the critiques of colonial healthcare practices and the resulting health inequities while privileging my research agenda.^{20,150,151} I am inspired by Indigenous relationships with nature, the planet,

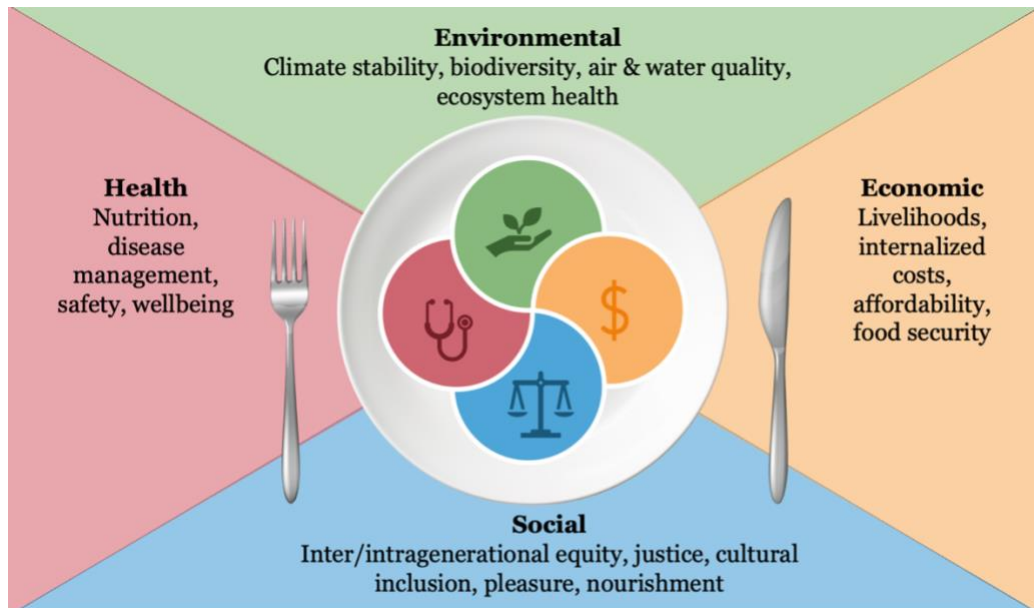
and other living beings that are not premised on anthropocentric values.^{20,152} The opportunity to learn about these relationships has transformed my conceptualization of planetary health. However, I am committed to incorporating a postcolonial lens and not appropriating traditional knowledge as my own.^{151,153}

3.2 Axiology

My intertwined identities are integral to my axiology. My research is motivated by the intrinsic value of the planet, nature, and all living beings. I am indebted to scholars such as Dr. Nicole Redvers²⁰ and other Indigenous Peoples for articulating this value. Anthropocentrism is closely linked to colonial mindsets that make normative distinctions and problematize difference.^{136,154} My definition of planetary health, therefore, specifically decentres humans. My axiology does not resonate with definitions of planetary health that emphasize the extrinsic value of ecosystem services needed for human prosperity.¹⁵⁵ Integrating a planetary health approach into research involves redefining prosperity as the well-being of the whole system, acknowledging that the worth of non-human entities is not relative to humans.^{138,145,156}

My conception of sustainable food aligns with that of planetary health. Sustainable food encompasses environmental, health, economic and social dimensions. The Food and Agricultural Organization's definition of sustainable food includes valuing the rights of nature, other living beings, and inter- and intragenerational equity; prioritizing nourishment; reducing disease risk; internalizing the external costs of food; promoting agricultural livelihoods; and stabilizing planetary systems.^{6,10,54,157–160} My research is grounded in a holistic conception of sustainable food (Figure 1), combining the Sustainable Development Goals¹⁶¹ with the definition of sustainable food from the FAO and other scholarly sources.

Figure 1.
Conceptual definition of sustainable food developed to guide this study ^a



^a Informed by Burlingame & Dernini, 2012²⁶; Mason & Lang, 2017⁵⁴; United Nations, n.d.¹⁶¹

My research is further motivated by the extrinsic value of health systems, including institutions and professionals, that are uniquely positioned to serve planetary health. Healthcare institutions and professionals are trusted role models, have committed to protecting and promoting health, and thus have a responsibility to integrate and model a planetary health approach.^{11,85,138,142,145,162} Sustainable health systems should not only serve human health, minimize environmental damage, and produce positive social benefits,¹⁶³ but should centre healing and benefits at a planetary level. To achieve such systems, we must challenge the historical grounding of the essentialist roles and priorities of healthcare systems in a reductionist, biomedical, and physician-dominated approach.^{139,140,142} The need for healthcare systems has evolved from medically managing acute illnesses and injuries. Chronic physical and mental health conditions, the interplay with social and environmental determinants of health, and the broader implications for families, communities, and the planet are now critical considerations.^{138,164} An upstream, inclusive, long-term approach recognizes the inherent worth of contributions from all

healthcare staff and the responsibility of Western healthcare systems to address health and climate justice globally, stemming from their historical contributions to declining planetary health.^{138,142}

Consistent with a critical research paradigm, I problematize the structures within healthcare that shape approaches to health, rather than individual practices of staff or patients.^{131,134} Healthcare professions' codes of ethics and education have begun incorporating the values of planetary health and healthcare responsibility, particularly in planetary health justice frameworks in nursing theory.^{85,138,145,164–166} Nursing theory is central to my axiology, including fostering a postcolonial lens, valuing holism, broadening a duty of care beyond humans, and promoting reciprocity.^{138,164,165}

3.3 Ontology

Implicit in my values is the belief that context shapes multiple, dynamic, interconnected realities and that power relations are key to understanding their influence. The entrenched role and priorities of healthcare systems epitomize this historical materialism.¹⁵⁴ The public health socioecological model and socioecological systems theory from sustainability science exemplify my ontology by examining the systems, relationships, and feedback channels inherent in the broader planetary system.^{137,167,168} My ontology is also consistent with scholarly definitions of a critical research paradigm, which assumes the existence of multiple realities conditioned by social forces.^{131,134,169}

3.4 Epistemology

Critical theorists contend that knowledge generation through research is embedded in values.^{150,170,171}

My values motivate data collection from diverse participants, especially those who have been traditionally marginalized in healthcare institutions. I assume knowledge is gained through the lived experience of multiple, intersecting identities.^{136,172} So-called expert knowledge can misrepresent these realities while depicting dominant ideas as “natural, necessary, and universally advantageous.”^{140,172}

Importantly, my epistemology assumes knowledge is relational and contextual, co-constructed between participants and the researcher. Researchers do not collect static, true representations.^{136,173} The researcher's interpretation is a key component of knowledge generation. Lincoln and Guba¹⁶⁹ have called this a subjectivist, mediated epistemology. The concept of crystallization resonates, as crystals evolve and produce different views depending on the conditions and how we hold them, much like knowledge generation over time.¹⁷⁴

My philosophical approach to this thesis, therefore, assumes a dialogic and relational epistemology aligned with a reflexive practice that acknowledges my role as a researcher in producing knowledge.^{136,170,175} In that spirit, I will question whether my findings reinforce or challenge dominant narratives. I will reflect on the underlying discourses and whether they align with or contradict my definition of planetary health and sustainable systems.^{136,140} I will continuously reflect on my situated knowledge, my fluid location between "insider" and "outsider", and the potential implications of my philosophical assumptions.^{136,175}

Chapter 4

Theoretical Approach

While intentionally centring my philosophical assumptions and critical research paradigm, this thesis is guided by concepts, theories, and frameworks from systems science, implementation science, and social science. Theories describe and explain a topic of interest using a set of principles or statements,¹⁷⁶ whereas frameworks describe the topic of interest by classifying multiple concepts or variables based on their relationships to the topic of interest and to each other.^{176,177} Frameworks delve into the details of the topic of interest, but do not explain why or how, as theories do.

Theories and frameworks are valuable for guiding the development of research while grounding the pursuit of new knowledge in prior literature. When applied deductively, they provide structure for data collection, aligning data with the research objectives.¹⁷⁸ This structure carries into data analysis, helping to interpret meaning from collected data.¹⁷⁸ Theories and frameworks can also be used in inductive analysis, where they are adapted based on collected data, contributing to their evolution based on the changing context and new knowledge.¹⁷⁶ The challenge is finding a relevant theory or framework from the literature that does not force research objectives or one's research paradigm into an ill-fitting or misaligned heuristic.¹⁷⁹ Adapting pre-existing theories and frameworks can address this challenge by selecting appropriate elements from multiple sources. Each contributes a different lens, complementing my philosophical assumptions that recognize the multiplicity of realities and the complexity of knowledge generation.

4.1 Systems science

The broader planetary system contains a multitude of complex socioecological systems. Each system contains interconnected social and ecological elements, actors, and feedback channels, and exists within a larger panarchy, an ordered collection of systems.^{180–182} Applying a systems-based approach broadens

prior research to examine the multitude of actors, relationships, and feedback channels influencing healthcare foodservice.¹¹⁷ Accounting for the behaviour of systems allows us to identify opportunities to maximize benefits while conserving scarce human, natural, and financial resources; anticipate unintended effects; and proactively plan mitigation strategies.^{180,181} A systems-based approach helps break down the silos in which actors often work and encourages collaboration across actors to achieve common goals,^{180,181} helping to minimize structural inequities, protect the health of human resources, promote planetary health, and reduce costs.^{33,60,61,64,74,112,113,183} Systems science is evident in my conceptions of planetary health and sustainable food.

Within systems science, leverage points are areas of convergence between systems, elements, and actors, where small changes have the potential to yield a cascade of benefits.^{182,184} Healthcare foodservice is one such leverage point with the potential for environmental, health, economic, and social benefits, leading to change within the food and health systems.^{21,25,55,185} Similarly, in systems science, tipping points are areas where several stabilizing forces, maintaining current conditions and constraining change—or negative feedback—and disrupting forces, encouraging and reinforcing change—or positive feedback—converge.¹⁸¹ Pushing a system into fundamental change involves weakening negative feedback and strengthening positive feedback.¹⁸¹ Uncovering such feedback channels within healthcare can accelerate action toward more sustainable foodservice and involves questioning dominant understandings of the essentialist roles and priorities of healthcare systems, aligning with my critical research paradigm.^{131–135} Systems science and a systems-based approach are central to this thesis and the predominant lens for data collection, analysis, and interpretation.

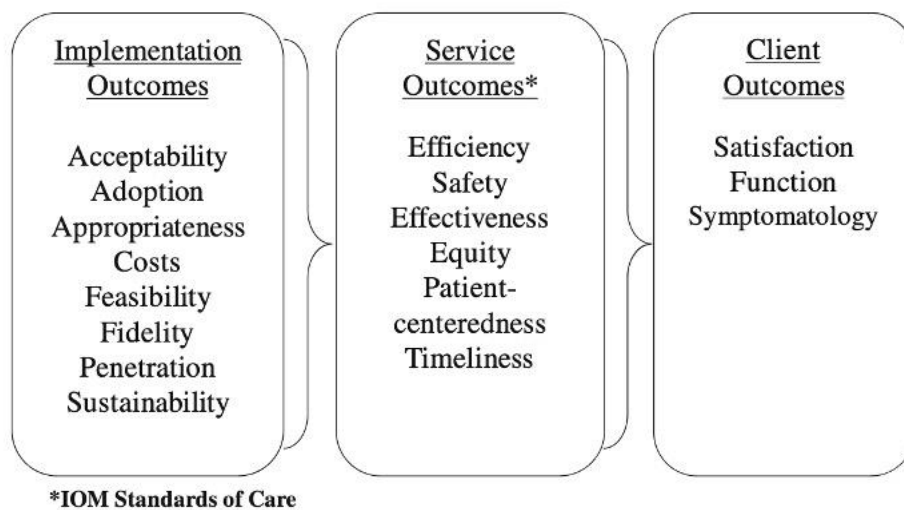
4.2 Implementation science

Systems and implementation sciences are complementary approaches to overcoming the gap between research evidence and practice change in healthcare.¹⁸⁶ Implementation science investigates effective means of transferring research evidence into practice, whether that transfer is passive diffusion, active

dissemination, or formal application,¹⁷⁶ aligning with my critical research paradigm that aims to effect fundamental change. Implementation science has evolved from a linear model to a systemic approach capturing the complexities of the healthcare environment, including the diverse actors with differing needs and perspectives, and feedback channels of policy changes, new best practice guidelines, and front-line innovations.^{116,177} My research objectives align with implementation research, as an exploration of “carrying an intention into effect.”^{187, p.1} This thesis is situated within real-world contexts to understand the influence of myriad factors, rather than controlling for their effect.¹⁸⁷

A critical step in implementation research is identifying the appropriate outcome to guide data collection and analysis (Figure 2).^{188,189} Adoption was identified as the most appropriate outcome for the thesis objectives. While the acceptability and appropriateness of sustainable food for the participants and the institutions are discussed, the uptake or use of sustainable food interventions is the primary focus. Assessing service, client, or other implementation outcomes, such as costs, penetration, and sustainability, was outside the scope of this thesis.

Figure 2.
Outcomes in implementation research ^b



^b Reproduced from Proctor et al., 2011¹⁸⁸

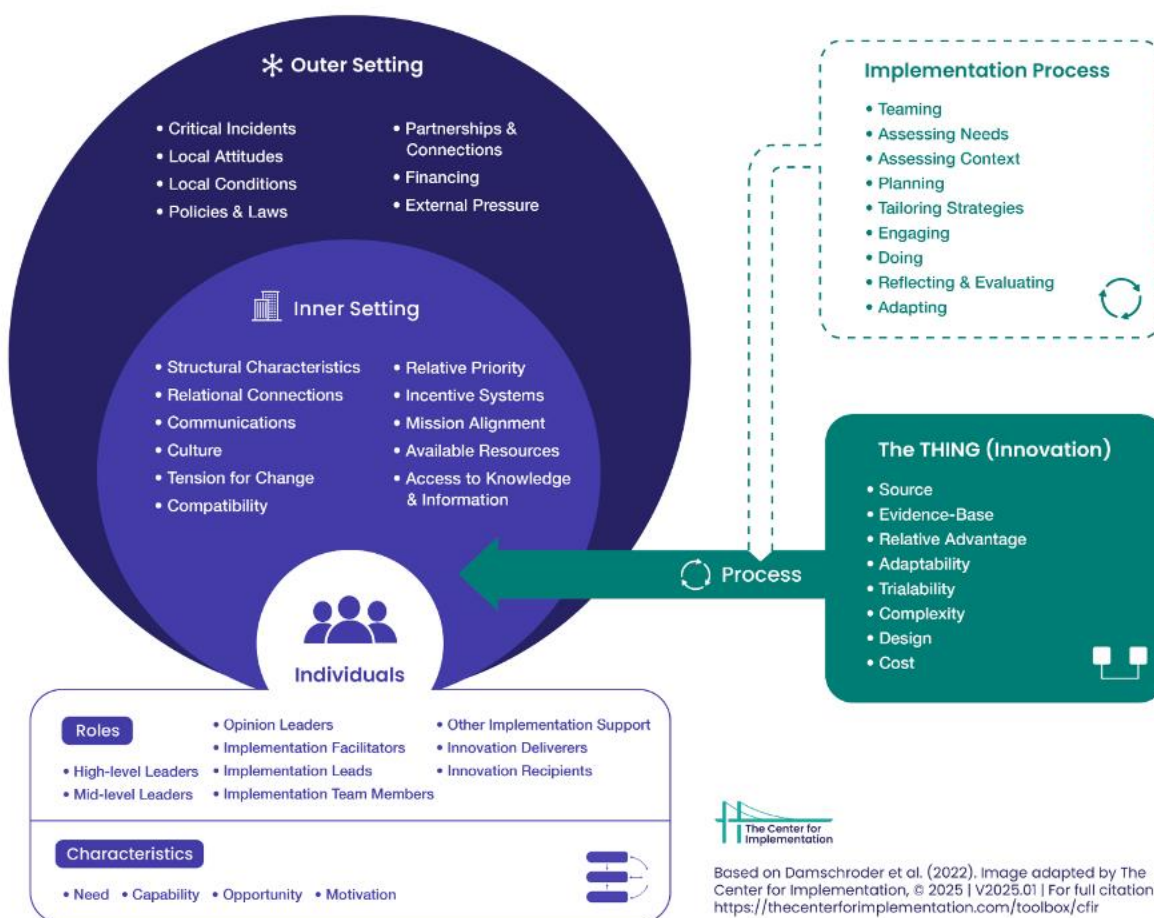
The concepts of negative and positive feedback, or tipping points, in systems science are similar to barriers and facilitators in implementation science.¹⁹⁰ Existing theories and frameworks guide the investigation of barriers and facilitators, helping to understand how, why, and what led to the adoption of sustainable food interventions in healthcare. Common theories and frameworks applied in implementation science include determinant frameworks and classic theories, used to understand influences on implementation outcomes.^{176,191} Determinant frameworks describe multilevel influences, including individual, organizational, and community constructs interacting to produce an outcome.¹⁷⁶ Thus, they apply a systems-based approach, recognizing the relationships between variables that combine to produce more than the sum of their parts.¹⁷⁶ However, determinant frameworks often assume linear relationships between influences and implementation outcomes rather than accounting for dynamic interactions.¹⁷⁶ Combining systems and implementation sciences is again advantageous, and this thesis applies these sciences in tandem. However, typically, determinant frameworks do not describe the characteristics of such relationships,¹⁹² and must draw on theory to explain how and why influence occurs.¹⁷⁶

4.3 Consolidated Framework for Implementation Research

The Consolidated Framework for Implementation Research (CFIR) is a meta-theoretical determinant framework, comprised of sixty-seven constructs across five domains: the innovation, inner setting, outer setting, individuals involved, and the implementation process (Figure 3).^{189,193} This framework was identified as relevant because of its flexibility and consideration of context. It is designed to be adapted to each study; researchers choose those constructs relevant to their study for consideration.¹⁹² The CFIR has been applied to prior research related to the transition to sustainable food, including by Wierda et al.¹¹⁷ Furthermore, factors identified in prior research as being relevant to practice change in healthcare and the implementation of sustainable food in healthcare foodservice are consistent with CFIR constructs and domains. For example, within the inner setting domain, CFIR lists physical infrastructure,

communication, and mission alignment as implementation influences,¹⁹³ while prior research identified kitchen space, communication between departments, and alignment with the mission and values of the institution as factors influencing sustainable food interventions.^{28,71,77,115}

Figure 3.
The Consolidated Framework for Implementation Research ^c



^c Reproduced from The Center for Implementation, 2025 ¹⁹⁴

CFIR draws on multiple theories of behaviour and implementation science to identify barriers and facilitators to implementation.^{177,189,192,193} It draws on COM-B theory, a psychological theory that explains individual behaviour change as arising from motivation, capability, and opportunity, to predict influences at the individual level.^{177,189} CFIR expands on COM-B to include the individual's need for change.¹⁸⁹

An advantage of this framework is its inclusion of multiple domains, whereas other determinant frameworks used in implementation science, such as the Theoretical Domains Framework¹⁷⁷, were deemed less applicable, given their focus on individual factors. Nevertheless, experts have argued the outer setting within CFIR remains theoretically underdeveloped, necessitating additional theory to explain how and why determinants external to the institution act as influences on implementation.¹⁹⁵ Understanding how and why certain factors have acted as barriers or facilitators is missing from prior literature on sustainable food in healthcare.^{114,123} Classic theories, including organization theories, draw on multidisciplinary fields such as sociology and psychology to describe and explain implementation outcomes at the collective level.^{176,177,191,196} Organization theories can explain how and why healthcare institutions adopt sustainable food interventions using the institution as the unit of analysis.^{186,195,196} Factors acting at the collective level cannot be leveraged to accelerate action if not explored.¹⁹⁶

4.4 Institutional Theory

Institutional Theory is an organization theory with a rich history in the social sciences.¹⁹⁷ It has been used by various studies in the last 30 years to understand sustainability transitions, such as household and business recycling and industrial use of sustainable materials.^{198,199} Carino et al.¹¹⁵ applied Scott's 2014¹⁹⁷ description of Institutional Theory to secondary data to compare engagement with sustainable food by business-as-usual and exemplar healthcare institutions globally. Scott¹⁹⁷ conceptualizes institutions as "multifaceted, durable social structures" providing meaning and stability to social life. The regulative, normative, and cultural-cognitive pillars (Table 1) are the mechanisms granting institutions power and legitimizing their control and directive use of resources.¹⁹⁷ Regulative pillars force actions using laws, policies, and rules, whereas normative mechanisms prescribe actions through principles and morals, and cultural-cognitive mechanisms presume actions based on social narratives.¹⁹⁷ For example, mission alignment is an effective facilitator or barrier to practice change because an institution's mission is a form of moral governance prescribing normative expectations.¹⁹⁷ These pillars work interdependently to

stabilize and generate meaning within and outside the institution.^{197,198} Cultural forces and normative ideals are equally important as regulative and positive influences.¹⁹⁷ Institutions are also understood to be in a constant state of change, given the dynamic nature of cultural beliefs and social life,¹⁹⁷ aligning with systems science. Institutional Theory does not presume universal laws but instead emphasizes the vital influence of local and distal social contexts in which institutions function.¹⁹⁷ These ontological and epistemological assumptions inherent in Institutional Theory resonate with my philosophical assumptions. Additionally, Institutional Theory promotes a balanced view of institutions as both controlling and empowering action, which appeals to my axiology valuing the intrinsic worth of planetary health and the extrinsic worth of healthcare institutions to support planetary health.¹⁹⁷ Scott¹⁹⁷ wrote that he was mindful of the “pathologies (of institutions) but also seeking to strengthen their integrity.”^{p.273} I believe in the power of healthcare institutions to direct and produce meaning, while recognizing that the use of their power must change. A key contribution of Institutional Theory is seeking to explain the mechanisms behind how and why CFIR constructs act as barriers and facilitators to sustainable food.¹⁹⁷

Table 1.
The three pillars of Institutional Theory ^d

	Regulative	Normative	Cultural-Cognitive
Basis of compliance	Expedience	Social obligation	Taken-for-grantedness Shared understanding
Basis of order	Regulative rules	Binding expectations	Constitutive schema
Mechanisms	Coercive	Normative	Mimetic
Logic	Instrumentality	Appropriateness	Orthodoxy
Indicators	Rules	Certification	Common beliefs
	Laws	Accreditation	Shared logics of action
	Sanctions		Isomorphism
Affect	Fear, guilt/innocence	Shame/honor	Certainty/confusion
Basis of legitimacy	Legally sanctioned	Morally governed	Comprehensible
			Recognizable
			Culturally supported

^d Reproduced from Scott, 2014, p. 60 ¹⁹⁷

4.5 Theoretical framework

The theoretical framework for this study thus consolidates CFIR and Institutional Theory (Table 2), applying the three pillars of institutions to explain how and why the CFIR domains and constructs

influence the adoption of sustainable food interventions in healthcare institutions. Each column of the table contains one institutional pillar (e.g., cultural-cognitive), and each row a CFIR domain (e.g., innovation). Each cell contains relevant CFIR constructs corresponding to each pillar and domain. Despite being conceptualized as a matrix, a systems-based approach is central to the framework. Interactions and non-linear relationships between domains and constructs of CFIR and the pillars of Institutional Theory are implicit in the matrix and actively explored in the thesis. I was open to the possibility that certain constructs were applicable to multiple institutional pillars and/or CFIR domains, dependent on the individual context of each institution.^{189,197} Furthermore, pillars can work interdependently.¹⁹⁷ For example, accreditation is not mandatory for healthcare institutions; it is a normative goal.²⁰⁰ Yet, to become and continue to be accredited, regulative standards must be met.²⁰⁰

Table 2. Theoretical framework for considering barriers and facilitators to sustainable food interventions in healthcare foodservice, consolidating prior research with CFIR and Institutional Theory ^e

	Regulative pillar	Normative pillar	Cultural-Cognitive pillar
Innovation: Sustainable food interventions	- Legislative mandate - Incentives - Institutional policies	- Professional codes - Accreditation standards - Scope of healthcare - Institutional mission, values & strategic goals	- Cost, complexity, adaptability - Perceived salience - Trade-offs - Evidence base - Institutional strategic goals
Inner Setting: All campuses of parent health corporation	- Foodservice model - Kitchen infrastructure - Food safety & infection control - Management of cafeteria, retail food, etc. - Budget - Contracts - Institutional policies	- Value of collaboration and communication - Value of leadership support - Value of foodservice - Priority of patient health, safety & staff wellness - Educate vs. respect patient wishes	- Workload pressures - Short vs. long-term thinking - Tension for change - Resources - Learning culture - Staff power and engagement - Volunteerism valued - Staff turnover - Communication - Collaboration & partnerships
Outer Setting: External to parent health corporation	- Market forces - Legislation - Federal/provincial funding - Contracts - Geography (climate, weather)	Value of environmental change, local food, equity and/or Indigenous reconciliation	- Patient beliefs and preferences - Media attention - Food producers - Current events - External partnerships - Innovations
Individuals: Staff of inner setting involved in implementation	- Job description - Incentives	Occupational codes of ethics	- Self-efficacy - Initiative - Intrinsic & extrinsic benefits - Skills and knowledge

Implementation process: Any activity between initial discussion and adoption of intervention	▪ Roles & responsibilities ▪ Funding ▪ Institutional leadership	▪ Interprofessional collaboration ▪ Accreditation standards	▪ Collaboration ▪ Communication ▪ Community engagement ▪ Staff participation ▪ Evaluation ▪ Adaptation ▪ Training
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^e Adapted from Damschroder et al., 2009; Damschroder et al., 2022; Scott, 2014

The inclusion of CFIR constructs within the framework and their applicability to each institutional pillar were determined by reviewing prior literature related to feedback channels in systems science, barriers and facilitators to practice change in healthcare, and research specifically examining barriers and facilitators to sustainable food in healthcare foodservice. Typical negative feedback in systems science, or barriers to change, includes social norms and market forces.¹⁸¹ Positive feedback in systems science, or facilitators to change, includes changes in accessibility or knowledge levels.¹⁸¹ Collective behaviour norms and staff education are strong influences on general practice change in healthcare,^{69,118} whereas research focused on barriers and facilitators to sustainable food interventions in healthcare cited market forces and patient preferences.^{64,71} Such factors complement constructs within CFIR, such as local attitudes and conditions in the outer setting, structural characteristics of the inner setting, and access to knowledge and information in the inner setting.¹⁹⁴ I consolidated factors from multiple research sources to refine the CFIR construct terms and to determine which pillar of institutions was most appropriate. For example, local attitudes within the CFIR outer setting domain were refined into patient beliefs and preferences within the outer setting domain and cultural-cognitive pillar, as well as into the importance of environmental change, local food, and equity within the outer setting domain and normative pillar.

The theoretical framework is meant to guide and inform data collection, analysis, and interpretation, not to make rigid, universal judgments. Rigidly applying a theoretical framework assumes a deterministic approach, which is not aligned with my critical research paradigm valuing inductive data gathered from the lived experiences of participants.¹⁷⁹ Integrating previously unacknowledged ideas grounded in the interview data, even if they were not part of the original theoretical framework, was

critical to avoid reinforcing majority opinions and marginalizing minority voices.¹⁷⁹ Additionally, the theoretical framework was applied to healthcare institutions in high-income Western countries. CFIR and Institutional Theory may not be appropriate to healthcare institutions in other contexts.

In summary, systems and implementation sciences are complementary approaches to exploring how sustainable foodservice in healthcare institutions can accelerate action toward more sustainable food and health systems. Both approaches align with my philosophical assumptions and critical research paradigm. CFIR, an implementation science framework, and Institutional Theory, an organization theory, are beneficial guides to maintain focus on the research objectives and to interpret meaning through the lens of prior literature. Institutional Theory helps explain how and why CFIR domains and constructs are barriers and facilitators to the adoption of sustainable food interventions in healthcare institutions in Ontario, while a systems-based approach maintains focus on the relationships and interactions between factors.

Chapter 5

“Making sense of the holistic why:”

Implementation of sustainable food in healthcare institutions in Ontario, Canada

Target journal: *Environmental Research Health*. In preparation.

5.1 Overview

Healthcare foodservice is a leverage point for shifting to more sustainable health and food systems, critical to addressing the deleterious consequences of such systems for planetary health. We explored barriers and facilitators to sustainable food implementation in the foodservice of an exemplar healthcare institution in Ontario, Canada, and compared factors to two Ontario institutions at different stages of sustainable food implementation. We conducted ten semi-structured interviews with eight individuals predominantly working in foodservice roles at the three institutions. Interviews were complemented by a review of 47 documents, including strategic and sustainability plans, from institutional websites. Data were analyzed using a systems-based approach and guided by a theoretical framework merging the Consolidated Framework for Implementation Research and Institutional Theory. Conceptual themes built on barriers and facilitators suggested in prior research to explore the nuances and explain how and why such factors were beneficial or challenging. In the institutions we studied, efficient systems reportedly addressed the demands of healthcare yet hindered sustainable food interventions. Creating opportunities for the integration of individual and collective values and beliefs contributed to making sense of how sustainable food is beneficial for patient care. Change management strategies, such as cultivating staff engagement, translating the holistic why, planning slow transitions, and managing cycles of iteration, helped develop shared understandings and adapt interventions to align with the changing context. Development was focused within foodservice before expanding to the broader institution. External partnerships reportedly provided opportunities for overcoming policy inertia and resource limitations common to the healthcare environment focused on immediate needs. Patient preferences are reportedly a continuing barrier to altering menus to be more sustainable. Staff and visitor food options and accreditation standards incorporating sustainable food indicators were identified as promising opportunities for shifting norms dictating usual practices. The study findings

highlight the systemic nature of implementation, as factors seemed to act collectively as feedback channels in a dynamic process constraining and reinforcing change.

5.2 Introduction

Health systems have significant consequences for planetary health. The World Health Organization advocates for a transition to low-carbon and climate-resilient health systems in response to the climate emergency and has created a global agreement to which 99 countries have committed.¹ Health system emissions not only lead to climate change but also to poor air quality, contributing to respiratory and cardiac diseases.^{2–4} Healthcare waste contaminates the air and water, leading to algal blooms and microplastic pollution, with cascading effects on health.^{3–5}

Paradoxically, health systems are directly impacted by environmental change and overburdened with treating the physical and mental health consequences. Since 2014, heat emergencies and wildfires attributable to climate change have led to infrastructure failures, patient transfers, and closures in healthcare institutions across Canada.⁴ Chronic diseases, such as cardiovascular disease, partly stemming from climate change and poor air quality, are the leading cause of hospitalizations in Ontario, costing the healthcare system \$10.5 billion in 2010.⁶ Furthermore, in high-income contexts, rising health expenditures are not associated with proportionate improvements in health outcomes, while having negative implications for health through emissions and waste.⁷ Experts emphasize that the most significant way to reduce this low-value care and the resulting consequences for planetary health is by preventing ill health and reducing the need for health services.^{8–10} Emphasizing preventative measures would bring health, economic, and social co-benefits from improved well-being and productivity.⁸

Mirroring the calls for more sustainable health systems, experts have called for a transformation of the food system to more sustainable production and consumption patterns to address the multidimensional impacts on planetary health and increase resilience to future challenges.^{11–18} Nutrition

is a key determinant of overall health and well-being, contributing to disease prevention and a reduced need for healthcare services.¹¹ Not meeting dietary guidelines cost an estimated \$13.8 billion in direct and indirect healthcare costs in Canada in 2014.¹⁹ Nutrition furthermore contributes to healthy aging, higher educational attainment, and productivity, factors that contribute to stronger resilience.⁶ Like health systems, food systems contribute to, yet are negatively affected by, environmental change.^{20,21} Production and consumption of animal-based food products, such as red meat and dairy, are the primary contributors to an estimated 25% of global emissions from the food system, while producing significant waste and pollutants, including fertilizers, pesticides, and plastic packaging.^{11,12,20,22,23} Industrial-scale livestock farming is associated with additional ecological and health challenges, such as antimicrobial resistance and the spread of zoonotic diseases.^{12,24} Concurrently, the effects of climate change are predicted to reduce food production and the nutrient quality of important crops, while increasing prices, food insecurity, and malnutrition.^{3,21,25}

Food is therefore a leverage point for instigating transformations to more sustainable health and food systems.^{5,26–29} Foodservice within healthcare institutions, encompassing the procurement and provisioning of food for patients, institutional staff, volunteers, healthcare students, patient families, outpatients, and emergency department visitors, is currently not leveraged for its potential or as an essential function within healthcare institutions,^{30–34} while contributing a significant portion of an institution's ecological footprint.⁵ Sustainable foods are defined as those with “low environmental impacts... culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources.”¹⁸ Several countries, including the United Kingdom, Denmark, the Netherlands, and Ireland, have begun shifting to more sustainable food within their healthcare services.^{35–38}

Canadian healthcare institutions serve 250,000 patient meals per day, at a total annual cost of \$4 billion.^{39,40} Leveraging this purchasing power by shifting to sustainable foodservice would strengthen

local food systems by supporting local food producers, incentivizing the production of sustainable food, and increasing its availability and long-term affordability.^{12,26,41,42} Some Canadian healthcare institutions have pledged to transition to low-carbon, climate-resilient health systems.⁴³ Nevertheless, the few existing studies assessing foodservice in Canada have found suboptimal nutrient quality coupled with high amounts of animal-based food options, driving persistently high emissions rates.^{36,44,45} In a scoping review of strategic plans and publicly available documents from 57 healthcare institutions in Ontario, we found that evidence of action towards sustainable food was limited and variable.⁴⁶ Most institutions had zero to three interventions, while just over one in five had evidence of ten or more interventions. Interventions recommended for their documented potential to improve sustainability, such as increasing plant-based foods, decreasing animal-based products, and eliminating single-use plastics,⁴⁰ were underutilized.

A common thread through the literature is the complexity of the healthcare environment, including diverse actors and both for-profit and not-for-profit food options,^{35,37} creating unique conditions for changing practices.^{27,35,44,47–50} Competing priorities, including clinical care, safety, and staff burnout, as well as debate about what role healthcare institutions should play in changing individual behaviours toward sustainability, can act as barriers to sustainable food interventions by reducing the ability and motivation to participate.^{51,52} Prior research has documented that the focus on efficiency and short-term costs, a shift away from on-site cooking towards reheating pre-prepared food from large broadline distributors (wholesale supplier of a range of food items from multiple food producers), and perceived patient preferences for animal-based foods limit sustainable food interventions.^{33,41,42,44,50,51,53–}

⁶⁰ A reliance on broadline distributors limits efforts to reduce the 20% to 30% of institutional waste originating from foodservice, as well as the cultural inclusivity of menu options with implications for equity.^{26,33,44} Outsourced staff and visitor food options act as a barrier to the availability and affordability of healthy, sustainable foods, impacting employee health and wellness,^{61,62} while having ripple effects on

the local economy.^{41,42} Prior research has suggested that facilitators to more sustainable foodservice include collaboration and communication within and outside of healthcare institutions, as well as alignment with institutional goals, leadership direction, dedicated sustainability roles, and staff education.^{27,37,50,51,53,56,57,63,64} However, there is conflicting evidence about how such factors influence sustainable food interventions across social and political contexts.^{41,49,53,57,63–65} Despite the complexity of the system, prior research has tended to focus on one group of stakeholders, one food provision model, or one food location in isolation, without considering how the system of different actors and elements interact to produce barriers and facilitators.^{49,53,55,57,64} There have been calls for a nuanced understanding of the specific factors across individual, institutional, and community levels, such as the type of leadership, education, and resources, that different actors have found most valuable toward change, as well as calls to document success stories.^{49,51,53,66}

Health is a provincial jurisdiction in Canada, producing a specific context in each province. Provincial legislation in Ontario controlling the management and operation of healthcare institutions does not directly regulate foodservice, allowing institutions to make foodservice decisions based on their individual priorities. We explored the barriers and facilitators to sustainable food interventions in the foodservice of an exemplar healthcare institution in Ontario, Canada, and compared barriers and facilitators to two additional Ontario institutions at different stages of sustainable food implementation.

5.3 Methods

5.3.1 Philosophical approach

This study is grounded in the first author's critical research paradigm, aiming to question dominant understandings and identify strategic opportunities for change.^{67,68} It is motivated by a belief in the intrinsic value of the planet and all living beings. We owe much to Indigenous worldviews for our conception of planetary health,⁶⁹ which acknowledges that the worth of non-human entities is not

relative to humans, and redefines prosperity as the well-being of the planetary system.^{70,71} This study is also motivated by the extrinsic value of health systems to mobilize improvements to planetary health. Accordingly, sustainable food is conceptualized holistically, integrating environmental, health, economic, and social dimensions (Figure 1). Implicit in our emphasis on holism is the belief that context and social forces shape multiple, dynamic realities.⁷² We assume knowledge generation is relational and constructed between participants and researchers,⁷³ and incorporates the active interpretation of the researchers. Identity and values are embedded in knowledge generation, underscoring the importance of making our philosophical assumptions transparent to understand their influence on the research design and data collection, analysis, and interpretation.^{68,74}

5.3.2 Theoretical framework

This study is guided by systems science. Accounting for the behaviour of systems identifies opportunities to maximize the benefits of sustainable food interventions while conserving scarce human, natural, and financial resources; anticipates unintended effects; and allows us to proactively plan mitigation strategies.^{75,76} Healthcare foodservice is considered a leverage point, where systems, elements, and actors converge, and where small changes have the potential to yield a cascade of benefits.^{26,77,78} Barriers and facilitators to action are considered negative and positive feedback channels, maintaining or disrupting current conditions.⁷⁶ Pushing a system into fundamental change involves weakening negative feedback (i.e., barriers) and strengthening positive feedback (i.e., facilitators).⁷⁶

The study is informed by implementation science, investigating effective means of transferring research evidence into practice.⁷⁹ The Consolidated Framework for Implementation Research (CFIR) is a determinant framework used to describe the multilevel influences on implementation outcomes.^{80,81} CFIR comprises sixty-seven constructs across five domains: the innovation, inner setting, outer setting, individuals involved, and the implementation process.^{80,81} CFIR has been explicitly applied in prior

research examining transitions to sustainable food in healthcare institutions,⁵² and many constructs included in CFIR, including communication and mission alignment, were identified in prior research as being relevant to practice change in healthcare.^{27,53,56}

Some have argued the outer setting of CFIR remains theoretically underdeveloped.⁸² Organization theories from the social sciences, such as Institutional Theory, can contribute to answering how and why questions at the collective level,^{82,83} and have been applied to explain engagement with sustainable food practices among international healthcare institutions.⁵⁰ According to Institutional Theory, regulative, normative, and cultural-cognitive mechanisms legitimize an institution's control and directive use of resources.⁸⁴ Regulative mechanisms (or pillars) force actions using laws, policies, and rules, whereas normative mechanisms prescribe actions through principles and morals, and cultural-cognitive mechanisms presume actions based on social narratives.⁸⁴ For example, mission alignment is an effective facilitator or barrier to practice change because an institution's mission is a form of moral governance prescribing normative expectations. We adapted CFIR and Institutional Theory to develop a theoretical framework (Table 1). Pre-existing theories and frameworks help interpret meaning through the lens of prior research.⁸⁵ We selected constructs from CFIR relevant in prior research on systems change, practice change in healthcare, and transitions to sustainable foodservice.^{42,50,76} The theoretical framework applies the three pillars of institutions to explain how and why the CFIR domains and selected constructs influence the adoption of sustainable food interventions in healthcare institutions.

Despite being conceptualized as a matrix, a systems-based approach is central to the framework. Interactions and non-linear relationships between domains and constructs of CFIR and the pillars of Institutional Theory are implicit in the matrix and actively explored in this study. We were open to the possibility that certain constructs were applicable to multiple institutional pillars and/or CFIR domains, dependent on the individual context of each institution.^{81,84} Furthermore, pillars can work

interdependently.⁸⁴ The theoretical framework guided data collection, analysis, and interpretation, rather than using a rigid, deterministic approach misaligned with a critical paradigm.^{79,86}

5.3.3 Methodology

Qualitative collective case studies explore implementation questions within healthcare,⁸⁷ gaining a deep understanding of a specific intervention outside of controlled conditions.^{86,88,89} While this study is predominantly focused on one exemplar institution, evidence from comparative institutions was integrated to explore the nuanced interaction between sustainable food interventions and the broader context by comparing experiences across settings.^{89,90} The case study design was guided by Stake's interpretivist approach to case studies.^{86,90}

We purposefully selected three cases, drawing upon our scoping review examining evidence of action towards sustainable food within 57 Ontario healthcare institutions with at least 100 beds.⁴⁶ We also consulted a knowledge user from a not-for-profit organization advancing sustainable food in healthcare institutions in Canada who previously worked as a foodservice manager in Ontario. Each case served as an instrumental example of broader categories of institutions across Ontario related to the stage of sustainable food implementation.⁸⁹ An exemplar institution, Hospital A, was chosen as a focus case. Hospital A has adopted numerous sustainable food interventions, including an on-site garden using produce for in-patient meals, food waste reduction efforts, organic waste composting, plant-forward meals, local foods, and the Coolfood Pledge to reduce greenhouse gas emissions from in-patient meals. The first comparative institution, Hospital B, has adopted organic waste composting, plant-based meals, an Indigenous traditional foods list, local foods, and the Coolfood Pledge. The second comparative institution, Hospital C, has adopted waste reduction efforts, including donating unused food and recycling used food containers.

Elements of the research design, including the case study methodology and comparison of institutions at various stages of sustainable food implementation, were informed by previous research.^{50,89} Reporting incorporated Braun and Clarke's Big Q Qualitative Reporting Guidelines, where the guidelines were congruent with a critical research paradigm and case study methodology.⁹¹ Data were generated from each institution using semi-structured interviews and document reviews. This study was reviewed and approved by a University of Waterloo Research Ethics Board (REB# 47909).

5.3.4 Participant recruitment and interviews

We recruited individuals working in the three healthcare institutions to participate in virtual semi-structured interviews. Virtual interviews were chosen due to their lower environmental footprint over travelling to each institution. An initial interview guide (Appendix A) was developed using the theoretical framework. The interview guide was piloted with the knowledge user consulted for case selection and with a qualitative researcher who works in the areas of food and sustainability. After pilot testing, changes were made to the guide to refine the language and sequence of questions to resonate with participants working in healthcare.

The knowledge user facilitated contact with initial connections at the three institutions via email. These initial connections obtained institutional consent to participate in the study. We asked contacts to recommend potential participants from diverse roles, including senior leadership, strategic planning, foodservice management, menu planning, food procurement, and front-line care, with essential knowledge for understanding the implementation of sustainable food interventions within each institution. Contacts were then asked to obtain permission to share contact information (email addresses) for potential participants. Ten recommended individuals were invited via email to take part in a 60-minute virtual interview and provided with an information letter (Appendix B) and informed consent form (Appendix C). Eight individuals, including four from Hospital A and two each from Hospitals

B and C, agreed to participate and were interviewed. Participants at Hospital A were contacted to participate in follow-up interviews to probe key themes in more depth. Two participants agreed to follow-up interviews, resulting in a total of 10 interviews. As participants were recommended by contacts based on their knowledge of sustainable food implementation, there were no additional screening or eligibility criteria limiting participation. No incentives or compensation were provided for participation.

Interviews were conducted by the first author, a nurse with experience in the Ontario healthcare system, training in public health and qualitative research, and no previous relationship with participants. Interviews were conducted using Teams (Microsoft Corporation, Redmond, Washington, United States). At the beginning of each interview, the first author reviewed the information letter and consent form with the participant, and either confirmed prior written consent or documented verbal consent (Appendix D). At the conclusion of interviews, participants answered a set of socio-demographic questions based on Canadian guidance for collection of inclusive data, including age range, racial/ethnic identity, gender identity, and profession,^{92,93} to understand whether perspectives varied by such characteristics. Interviews were audio- and video-recorded to enable transcription using Teams (Microsoft Corporation, Redmond, Washington, United States). Transcriptions generated by Teams (Microsoft Corporation, Redmond, Washington, United States) were confirmed by the first author against recordings immediately following each interview. Transcripts were then cleaned of identifying information and uploaded to NVivo 15 (Lumivero, Denver, Colorado, United States). Audio and video recordings were then deleted. The first author recorded field notes before, during, and after interviews using a field note template (Appendix E) to facilitate researcher reflexivity, provide additional context to interview data, and reflect on key messages from each participant. Interviews at Hospital A were conducted in February and March 2026, at Hospital B in April 2026, and at Hospital C in May 2026. After each interview, participants were provided with a letter of appreciation via email (Appendix F).

5.3.5 Document review

To complement the interviews, we collected publicly available documents, including sustainability reports and financial statements, from the websites of the three healthcare institutions. We searched the institutional websites using the search terms “food,” “planetary health,” “sustainable,” and “green” between January and May of 2026 for documents related to sustainable food interventions within patient, staff, and visitor food options. Additionally, we leveraged documents pertaining to the participating institutions, including strategic plans, from a prior scoping review examining evidence of action towards sustainable food in healthcare institutions in Ontario.⁴⁶ The first author used the theoretical framework as a guide to extract information relevant to the implementation of sustainable food. For example, strategic commitments to promote environmental stewardship were extracted from institutional strategic plans, while details of an external partnership to develop an on-site garden were extracted from institutional press releases. Data extracted from documents were used to contextualize interview questions, and were integrated with participant interviews in data analysis.

5.3.6 Data analysis

We used a six-stage framework analysis method informed by prior research to analyze interviews, and documents.^{89,94–96} Framework analysis is common in public health and case study research for applying a dual deductive and inductive approach to analyze multiple sources of data while enabling comparisons across cases.⁸⁹ The first author created an *a priori* coding template in NVivo 15 (Lumivero, Denver, Colorado, United States), using the CFIR domains and Institutional Theory pillars as parent codes, and relevant CFIR constructs from the theoretical framework as child nodes. The first author then deductively coded transcripts after each interview according to the coding template. Inductive coding was also a key component of preliminary analysis, wherein new codes were created when interview data presented information not already included in the framework, iteratively adapting the coding template as interviews progressed. Field notes were leveraged to adapt the interview guide after each interview to

probe key messages in more depth and to address areas of the theoretical framework which had not yet been covered. The interview guide was also adapted between initial and follow-up interviews at Hospital A, and before interviews at Hospitals B and C, to understand whether factors influencing implementation at Hospital A acted in a similar manner across the comparative institutions.

After all interviews were completed, the first author reviewed the entire dataset by institution⁹⁴ in the second stage of analysis. Codes were refined, merged, and defined in NVivo. Yet, challenges arose in generating deeper meaning from the numerical summaries and functions within NVivo. After consulting with a co-author, the first author shifted from NVivo analysis to creating systems maps using data from interviews and documents, as well as the theoretical framework. Systems maps incorporated the five domains of CFIR, illustrated the collective effect of individual factors, contributed to several iterations of a matrix and, ultimately, a thematic framework to address the research objectives. The first author then indexed data from the interviews and documents to the thematic framework in the third stage of analysis.⁹⁴ Next, the first author created a final matrix in Excel (Microsoft Corporation, Redmond, Washington, United States) by healthcare institution and participant (in rows) and key themes of the thematic framework (in columns). Indexed data were charted into the matrix cells in the fourth stage of analysis. For example, details extracted from documents about a quality improvement project aimed at improving staff wellness were charted into the cell corresponding to the institution row and the relevant theme column. Next, the first author summarized the information in each cell into each institution's and participant's perspective on key themes.⁹⁶ In the fifth stage of analysis, the first author interpreted the data within the matrix to identify patterns, similarities, and differences first by institution, and then across institutions, to develop conceptual themes. The theoretical underpinnings of the conceptual themes were interpreted by mapping themes to the theoretical framework and prior research in the final analysis stage.⁹⁶ This interpretation and mapping continued throughout the drafting of the manuscript as the first author's understanding evolved.⁹⁴

This study is situated in a critical research paradigm acknowledging that knowledge generation is relational and incorporates the active interpretation of the researchers. Themes are presented as a blended narrative,^{97–99} integrating and contrasting disparate sources of data while situating conceptual themes within context. This approach also helps to protect the anonymity of the institutions and participants⁹⁹ since the experiences of the institutions and participants, rather than their identities, were the focus of this study. The narrative integrates data from each case, rather than presenting a case-by-case analysis, to reflect the systems-based approach and because of the relatively small number of individuals interviewed at each institution, particularly the comparator hospitals.

5.4 Results

Eight participants ranged in age from 20 to 65 years, had a variety of racial and ethnic identities, and all had completed some form of post-secondary education. Participants had been employed in their institution for one to 35 years and represented various professions, including dietitians, nutritional managers, and application specialists. Participants represented diverse levels of leadership and roles, such as strategic planning, management, food procurement, and kitchen supervision. All were employed within foodservice, except one participant from environmental services (housekeeping).

Forty-seven documents (Table 3) were identified from institutional websites and the prior scoping review.⁴⁶

Table 3. Documents identified from the websites of the three healthcare institutions

Institution	Reports	Website searches	Total
Hospital A	Strategic Plan 2025-2029	11 results	15
	Quality Improvement Plan (QIP) 2026		
	Energy Reporting and Conservation Management (CDM) plan 2024-29		
	Financial Statements 2010/11 – 2024/25		
Hospital B	Strategic Plan 2019-2026	8 results	17
	Sustainability Plan 2024-2029		
	Sustainability Reports 2022/23 & 2023/24		
	Quality Improvement Plan (QIP) 2024/25		

	Energy Consumption and GHG Emissions 2017-2023		
	Waste Diversion Reports April 2025 & August 2025		
	Financial Statements 2018-2025		
Hospital C	Strategic Plan 2024-2027	9 results	1
	Annual Corporate Plan 2025/26		
	Energy Conservation and Demand Management (CDM) plan 2024-2029		
	Quality Improvement Plan (QPI) 2026/27		
	Financial Statements 2019-2025		
	3 rd party foodservice management sustainability commitments		

Documents and participants described differences between institutions, including size, the institution's relationship with sustainability, foodservice management and model, and procurement sources and priorities (Table 4).

Table 4. Characteristics of the three healthcare institutions according to documents and interviews

Institution	Location & size	Approach to sustainability	Foodservice management & model	Procurement sources	Procurement priorities
Hospital A	Mid-sized urban area	Strategic commitments to environmental sustainability and responsible resource use	Hospital managed	Broadline distributor (majority)	Patient satisfaction
	1000 beds		Hot beltline		Budget
	5 campuses		Some in-house production	Group Purchasing Organization (GPO) for local items (minority)	System compatibility
			On-site chefs		Nutritional quality
			Patient choice model	Some individual contracts with local growers	Sustainability
				On-site garden	

Hospital B	Dense metropolitan area	Strategic commitments to environmental stewardship and net-zero healthcare	Hospital managed	Broadline distributor	Budget
	1500+ beds		Cold beltline	GPO	Patient satisfaction
	2 campuses	Formal Sustainability Plan	Rethermalization before service		System compatibility
		Sustainability team, advisory committee, and sub-committees	Some in-house production		Availability on contract
			One on-site chef		Nutritional quality
			Patient choice at one campus		GHG emissions
Hospital C	Small urban area	Strategic commitments to environmental stewardship and healthy communities	3 rd party managed	Three distributors under contract with 3 rd party foodservice management	Patient satisfaction
	< 500 beds		Ready-made, individually wrapped meals with 3-day expiry date		Waste/budget (paid per patient meal day)
	2 campuses	Green team with interventions in energy conservation and recycling	Reheated on patient units	Some bulk purchases, portioned in-house and frozen	Nutritional quality
			No kitchen infrastructure or on-site chefs		
			Restaurant-style menu with 10+ choices		

The six generated themes reflect participant interviews, document analysis, and researcher positionality and values. In the institutions we studied, efficient systems reportedly addressed the demands of healthcare yet hindered sustainable food interventions. Creating opportunities for the integration of individual and collective values and beliefs contributed to making sense of how sustainable food is beneficial for patient care. Change management strategies, such as cultivating staff engagement, translating the holistic why, planning slow transitions, and managing cycles of iteration, helped develop shared understandings and adapt interventions to align with the changing context. Development was focused within foodservice before expanding to the broader institution. External partnerships reportedly provided opportunities for overcoming policy inertia and resource limitations common to the healthcare environment focused on immediate needs. Patient preferences are reportedly a continuing barrier to altering menus to be more sustainable. Staff and visitor food options

and accreditation standards incorporating sustainable food indicators were identified as promising opportunities for shifting norms dictating usual practices.

Each theme was mapped to the theoretical framework (Table 5). The narrative below discusses why and how factors acted as barriers or facilitators to change by mapping factors to the three pillars of Institutional Theory.

Table 5. Overview of conceptual themes and subthemes, mapped to the theoretical framework merging prior research with CFIR and Institutional Theory ^f

Main conceptual themes & subthemes	Applicable CFIR domain(s)	Applicable CFIR construct(s)	Applicable pillar(s) of Institutional Theory
■ Efficiency meets sustainability			
Efficient systems were necessary for participants to check as many decision-making boxes as possible	Outer setting Inner setting	Contracts Funding Market pressure Legislation Kitchen infrastructure Foodservice model Available resources	Regulative
Efficient systems had reinforcing co-benefits for participants	Outer setting Inner setting	Contracts Current events Contracts Budget	Regulative
Efficient systems were reported as barriers to waste reduction, chronic disease management, and culturally inclusive and plant-forward meals	Innovation Inner setting Implementation process	Complexity Adaptability Cost Kitchen infrastructure Foodservice model Collaboration & partnerships Available resources Assessing context	Regulative Cultural-cognitive
In-house cooking was reported as a promising facilitator but faced barriers to expansion related to efficient systems	Innovation Inner setting Implementation process	Complexity Adaptability Kitchen infrastructure Assessing context	Regulative Cultural-cognitive
■ “Making sense” of sustainable food			

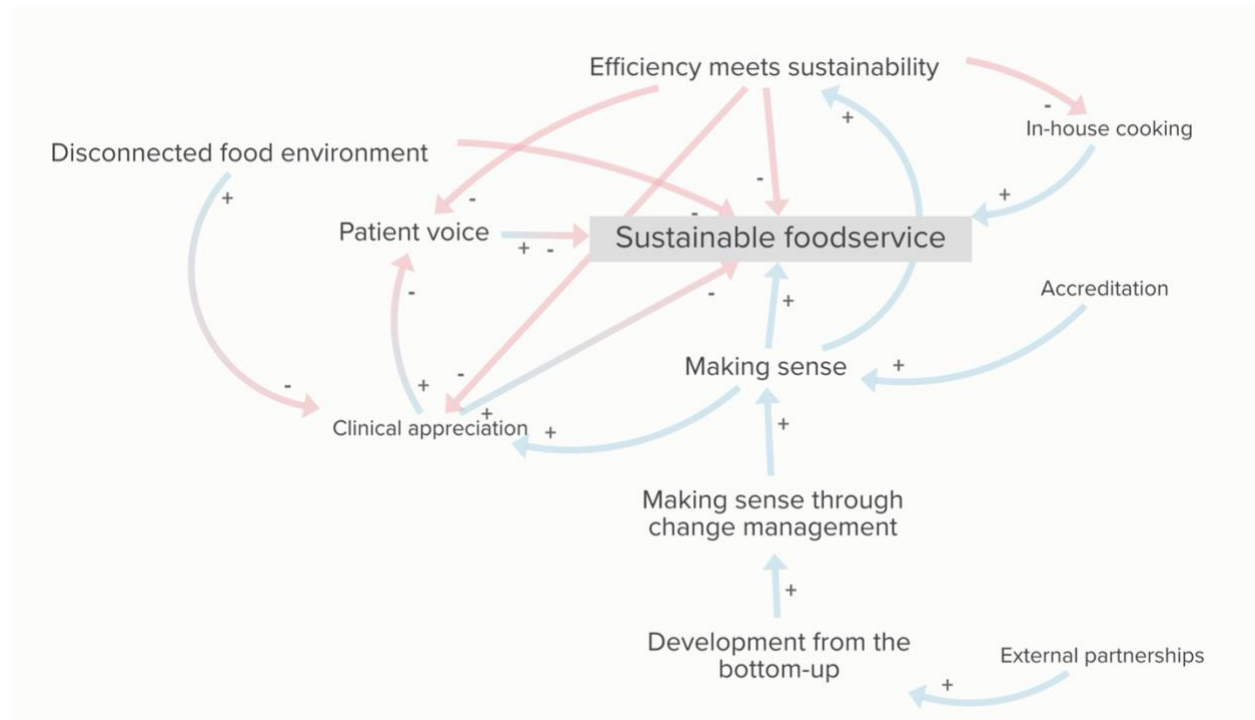
Participants reported sustainable food interventions needed to “make sense” within the context	Innovation Inner setting Implementation process Individuals	Perceived salience Relative advantage Relative priority Communication Learning culture Mission alignment Strategic goal alignment Tension for change Training Staff participation Communication Interprofessional collaboration Assessing needs Assessing context Skills & knowledge Job description Intrinsic & extrinsic benefits Motivation	Cultural-cognitive Normative
■ “Making sense” through change management			
Active staff engagement & knowledge sharing about the holistic why were reported to facilitate “making sense”	Inner setting Implementation process Individuals	Collaboration & partnerships Communication Learning culture Staff power & engagement Staff participation Collaboration Communication Assessing needs Assessing context Skills & knowledge Self-efficacy Opportunity	Cultural-cognitive
Approaching change as a long-term journey was reported to facilitate “making sense”	Inner setting Implementation process Individuals	Short vs. long-term thinking Learning culture Staff power & engagement Staff participation Evaluation Adaptation Skills & knowledge	Cultural-cognitive
Iteration was reported to facilitate aligning the intervention with the changing context to “make sense”	Innovation Inner setting Implementation process Individuals	Adaptability Collaboration & partnerships Kitchen infrastructure Foodservice model Assessing context Tailoring strategies Evaluation Adaptation Embedding Self-efficacy Skills & knowledge Job description	Regulative Cultural-cognitive
■ Development from the bottom-up			

Participants reported that “making sense” and change management were developed within foodservice without top-down direction or participation	Inner setting Implementation process Individuals	Collaboration & partnerships Tension for change Learning culture Value of leadership support Staff participation Collaboration Evaluation Adaptation Initiative	Regulative Normative Cultural-cognitive
External partnerships were reported to compensate for missing resources	Outer setting Inner setting Implementation process	External partnerships Resources Learning culture Community engagement	Regulative Cultural-cognitive
■ <i>“The patient voice is at the center of what we do.”</i>			
Healthcare training reportedly appreciated the value of food as medicine	Innovation Inner setting Individuals	Perceived salience Relative priority Mission alignment Scope of healthcare Tension for change Skills & knowledge Motivation	Normative Cultural-cognitive
Patient satisfaction reportedly overshadowed other foodservice goals	Outer setting Inner setting Implementation process Individuals	Patient beliefs & preferences Priority of patient health & safety Educate vs respect patient autonomy Tailoring strategies Intrinsic vs extrinsic benefits	Normative Cultural-cognitive
Patient preferences were reported as barriers to sustainable food interventions, complicated by the diversity of the patient population	Outer setting Inner setting Implementation process	Patient beliefs & preferences Priority of patient health & safety Educate vs respect patient autonomy Evaluation Adaptation	Normative Cultural-cognitive
Helping patients “make sense” of sustainable food was reportedly not within foodservice’s role	Outer setting Inner setting Implementation process	Patient beliefs & preferences Educate vs respect patient autonomy Scope of healthcare	Normative
■ A disconnected food environment			
Staff and visitor options were reportedly managed externally for profit	Outer setting Inner setting	Contracts Funding Market forces Policies Contracts	Regulative
Patient foodservice and staff and visitor options were reported as being disconnected, yet there could be opportunities for facilitating sustainable food	Outer setting Inner setting	Contracts Patient beliefs & preferences Market forces Kitchen infrastructure Foodservice model Management of cafeteria, retail food, etc. Priority of staff wellness Collaboration & partnerships	Regulative Normative Cultural-cognitive

^fInformed by Damschroder et al., 2009; Damschroder et al., 2022; Scott, 2014

Themes built on each other to tell a story describing how individual barriers and facilitators interacted, combined, and acted as feedback channels, either constraining or reinforcing change toward sustainable foodservice (Figure 4).

Figure 4. Systems map illustrating interactions of key themes constraining and reinforcing change toward sustainable foodservice. ^g



^g Red connections represent barriers constraining change toward sustainable foodservice. Blue connections represent facilitators reinforcing change toward sustainable foodservice. Red and blue connections represent both barriers and facilitators. Grey connections did not seem to have a meaningful effect.
Made with Kumu (Gitbook, Covina, California, United States).

5.4.1 Efficiency meets sustainability

Efficiency was a recurring topic influencing foodservice at each institution that seemed to be rooted in the regulative pillar of Institutional Theory. The regulative pillar comprises policies, laws, and rules that compel or force compliance. Participants described challenges related to funding from the outer setting and budget of the inner setting. According to documents, Hospital A is in a stronger financial position than the comparative institutions, reporting annual surpluses dating back to 2010. Hospital B has

reported yearly deficits since 2019, and Hospital C has reported smaller annual surpluses in most years. Nevertheless, participants at Hospital A described a sense of “*fiscal responsibility*” to spend public tax dollars wisely, which implied the influence of the normative pillar from Institutional Theory. Participants further explained that, coupled with increasing patient volumes, budget constraints have increased pressure to do more with less. Participants described the need to “*tick off more than one box*” when making foodservice decisions, including reducing resource use and costs and ensuring patient satisfaction, while simultaneously maintaining a consistent amount of food to match patient volumes. Such conditions have created the need for streamlined, efficient systems conducive to procurement from Group Purchasing Organizations (GPOs) and broadline distributors. Reflecting on this, participant 3 at Hospital A shared,

“We're balancing so many things, budget, what's on contract, what do the patients want to eat? We want to reduce our emissions, but we want to keep the protein high. We want to keep the fibre high. We have production constraints in the kitchen. They can't just make all these wonderful things that we have great ideas for. A lot of tug of war in terms of priorities. There are opportunities and limitations everywhere... if we have a concept for a new recipe, we're going to go to (broadline distributor) to search for all the pieces we need. I don't know if there's real value in searching out smaller vendors... cause it's about keeping it simple as well. If it can come on the (broadline distributor) truck, that's fantastic. It just bakes right into our system.”

Participants at Hospital C described further constraints from the reallocation of space and resources from foodservice to patient care. The two participants from Hospital C were employed by a third-party organization, to which foodservice and other institutional departments had been outsourced to further conserve resources.

Participants from each institution described the co-benefits reinforcing streamlined, efficient systems. Participant 3 at Hospital A identified insulation from rising fuel prices and supply chain disruptions as advantages of contracts with GPOs and broadline distributors, as compared to holding multiple contracts. Participants at Hospitals A and C described that limiting the number of procurement contracts reduces the number of deliveries to the institution's docks, where capacity is already strained from the significant amount of healthcare supplies received to smaller, older loading docks.

At each institution, characteristics of streamlined, efficient systems were described as barriers to sustainable food interventions, such as waste reduction, chronic disease management, and plant-based and culturally inclusive meal options. Participant 3 at Hospital A noted that a reliance on broadline distributors had increased packaging waste, especially for meals individually wrapped in plastic. The nutrient quality of meals available from procurement sources did not always promote chronic disease prevention or management, such as high sodium levels, according to Participant 1 from Hospital B. Participants from each institution indicated that culturally inclusive meal options from procurement sources were limited, more expensive, or lacked authentic flavour and consistent quality. While plant-based meal options had become more available from procurement sources, participants from each institution described that such meals lacked consistent quality and visual appeal. Participant 1 from Hospital B indicated that the visual appeal of plant-based and seasonal items suffered further during re-thermalization (meals are plated cold and quickly reheated at high temperatures before service). Seasonal items could not be incorporated into meals according to participant 1 at Hospital C, given the reliance on ready-made, individually wrapped meals that were microwaved before service. The ability of participants from Hospitals A and B to go outside of existing contracts to address some of these barriers was limited by contract clauses, delivery schedules, and the need for large volumes of prewashed and cut food for efficiency. Furthermore, Participant 3 from Hospital A discussed that local food producers were more likely to focus on the retail consumer market, where profits and visibility are higher, rather

than signing strict contracts with a sector that has historically ignored them. Comparatively, Participant 1 from Hospital C was limited to the options offered at three vendors who have existing contracts with the third-party foodservice manager.

To overcome some of the barriers stemming from efficient systems, participants from Hospitals A and B described the flexibility to design and prepare culturally inclusive, plant-based, and/or healthier meals in-house. However, these participants also described barriers to the expansion of in-house cooking, such as space and the labour cost of skilled chefs required for recipe, ingredient, and quality management. It was also described that efficient systems are not conducive to the time and creativity needed to design and prepare in-house recipes. Participant 1 from Hospital B described struggles with the cost of labour required to expand in-house cooking, compounding the lack of availability of sustainable food options from distributors:

“We have to extend cook hours, a lot of times there isn’t funding for that. That’s where the budgetary constraints affect our progress, because there’s only a certain number of things we can provide in-house and only a certain number of things that are outside that we can buy.”

In contrast, Participant 1 from Hospital C described the inability to cook in-house:

“It would have helped us if we were doing everything in-house... we can’t do anything in-house. Just get the meals from outside, like takeout. A kitchen cannot be called a kitchen when it’s not cooking. It’s storage.”

At Hospital C, limited capacity to cook in-house was described as a barrier to many sustainable food interventions that participants from Hospitals A and B were able to implement, such as adapting plant-based recipes in response to patient feedback. According to participant 2 at Hospital C, speed and convenience are “*paramount for patient flow*,” limiting practices such as diverting organics and

packaging from landfill. Participants from Hospital C identified more efficiency constraints related to contracts, space, and resources than Hospitals A and B.

5.4.2 “Making sense” of sustainable food

Participant 2 from Hospital A described that foodservice is recommended to follow Canada’s food guide, which emphasizes plant-based proteins, and to ensure dietary reference intakes. However, *“There is no thou shalt”* regarding what foodservice serves. This appeared to indicate the regulative pillar did not force compliance with any procurement or provisioning standards, nor with sustainable food. Instead, participants from each institution repeatedly returned to the expression *“makes sense”* when explaining foodservice decisions and why a sustainable food intervention might be implemented. Sustainable food was described as *“making sense”* in different ways. For example, participants at Hospital A, the exemplar institution, reported that an on-site garden *“makes sense”* because it aligns with the mission, values, and strategic goals of the institution, which, according to documents, emphasize community health through partnerships and innovation. Participant 2 at Hospital A explained:

“(Strategic goals) are very lofty and high level. Sometimes it is hard to say how does this impact what we do or how does this impact me... as we come up with these projects, we need to find how does it link. So how does this make sense? Because it always comes back to it needs to make sense why we’re doing something... how do you support something that isn’t in alignment with why you’re here, right? Why are we here?”

This participant explained that sustainable food projects align with the strategic goals of:

“Building a better world... building partnerships... researching better ways of doing things... (and) being as responsible as possible with all of our money going into the healthcare system.”

For participant 3 at Hospital A, sustainable food *“makes sense”* because:

"It keeps us thinking creatively and keeps us engaged with the mission and the people we serve and work alongside."

Participants at Hospital A also *"make sense"* of sustainable food through measurement and concrete numbers, such as the amount of food grown for patient meals in the on-site garden or patient satisfaction with in-house cooked meals. Participants noted *"you can't change what you don't measure,"* and numbers are *"hard to ignore."*

For participants at Hospital B, the comparative institution with more evidence of progress toward sustainable food, sustainable food *"makes sense"* because: *"It's the right thing to do"* and *"it's part of something that we as a department believe in... it's part of our core values."* Conversely, participants at Hospital C, the comparative institution with less evidence of progress toward sustainable food, connected sustainable food interventions to cost savings. Participant 1 at Hospital C explained that within foodservice, the underlying objective of waste reduction efforts was cost savings, rather than reducing GHG emissions or pollution. This participant described personal motivation to expand sustainable food interventions. For participant 2 at Hospital C, composting and other sustainable food interventions would *"make sense"* if the benefits aligned with patient care and cost savings.

"If you can find a cost saving, all of a sudden a lot more people become involved and more interested... it's kind of a cause and effect... we're looking to make changes where it makes sense, and if it makes sense for the organization, if it benefits patient care, then absolutely that's something that we're going to explore."

However, several barriers to *"making sense"* were described, including a limited understanding of sustainable food across the institutions. For instance, participant 1 from Hospital B indicated,

"A lot of people don't know the benefits or even how food in the hospital can promote sustainability... we could certainly do more education or knowledge sharing."

Participants from each institution acknowledged that sustainable food is generally not well understood outside of foodservice. Participants from Hospitals A and B identified that when a new intervention was implemented, it was shared amongst department managers in monthly meetings, but rarely with front-line clinical staff directly. This challenge was complicated by the physical separation of foodservice from the rest of the hospital. Participant 2 from Hospital A stated:

"It's tough... we're tucked in a basement. If the food arrives and things are good, people are happy. Seems easy, right?"

Similarly, participant 1 from Hospital C remarked, *"They don't see what happens in the basement. Nobody comes in the basement other than us."*

Another described barrier to *"making sense"* was competing messages and priorities, especially for clinical staff who serve and/or assist feeding patients. Participant 3 from Hospital A commented that clinical staff who may be unfamiliar with a meal or its intended purpose can influence patient acceptability through negative framing. *"Controlling the message given to patients is challenging."* This participant further explained:

"There are so many people and so many competing messages, and maybe the clinical messages they need to receive are more important than our fuzzy, good feeling story about our food. There are some pretty big barriers there to getting that message to land. The capacity to take in more than we need is really limited. If it's not directly related to my task today, I'm going to put it on the back burner and it's not going to be embedded."

Participant 1 from Hospital B suggested there may be an opportunity to leverage the health benefits as one way to make sustainable food interventions *"make sense"* to clinical staff.

“When we first started the project, it was sustainability, sustainability, and then, health benefits were secondary. But the thing is... if you pushed the health benefits, it may have more of an impact.”

“Making sense” seemed to stem from the cultural-cognitive pillar of Institutional Theory, wherein social narratives presumed adherence to new practices. Social narratives related to the perceived salience of sustainable food and the importance of cost savings and alignment with the institutional mission, values, and goals seemed to generate buy-in for sustainable food interventions. Conversely, buy-in seemed to be hindered by social narratives related to the lower relative importance of sustainable food and foodservice for patient care compared to clinical practice. Participants implied that communicating how foodservice and sustainable food connect to different institutional priorities could help interventions *“make sense”* and improve recognition of foodservice’s contribution to patient care.

5.4.3 *“Making sense”* through change management

Participants at Hospitals A and B, the exemplar institution and the comparative institution with more evidence of progress toward sustainable food, described change management strategies that helped foodservice staff *“make sense”* of sustainable food interventions. Participants at Hospital A described change management as a continuous cycle of engaging, knowledge sharing, iterating, and embedding that appeared to stem from the cultural-cognitive pillar of Institutional Theory.

For participant 4 at Hospital A, staff engagement within foodservice was the most important recommendation for *“making sense”* of sustainable food interventions. They identified that staff, specifically dietary aides and cooks, need to understand the purpose and benefits of the intervention:

“You want to make sure to engage them, to educate them about the purpose of why you are trying to change or add to the current process, because they’re the ones who are making it,

putting out the work... the supervisors are just here to support behind the scenes, but they're doing the actual thing."

Such understanding, as well as being involved in the planning of the interventions, seemed to build individual self-efficacy and buy-in. Similarly, participant 3 at Hospital A described a meeting with a vegan chef that got the kitchen staff's *"creative gears going... (and) drove buy-in"* for plant-based meals.

Participant 4 from Hospital A further identified that staff engagement was facilitated by familiar communication channels to share knowledge rather than new processes, such as an instructional video or one-time workshop. They identified that daily huddles are a consistent opportunity for *"real-time two-way communication... discussion... (and) getting feedback,"* so staff felt engaged. Participant 2 from Hospital A described that translating the holistic reasons behind an intervention was an essential component of knowledge sharing, and seemed to allow staff to connect sustainable food interventions to their own role in patient care.

"It sounds simple, but you have to understand the why, and you have to understand the holistic why. Because what makes sense to one person doesn't always to someone else... So, if we're looking at making a change because it reduces carbon emissions... some don't care, but it's also we're increasing fibre, there are health benefits, so you have to have the whole picture to support why we're making a change. And then it's translating that... making the unfamiliar understandable."

Despite the identified benefits of knowledge sharing for *"making sense"*, the availability of formal sustainability training for new or existing staff was not identified by participants at any of the institutions. Participant 2 from Hospital A epitomized most participant reactions when asked about the availability of sustainability training: *"That's a good question. I don't know that we have anything specific."* Participants at Hospitals A and B commented that the knowledge and skills they have

developed would be informally passed on to new staff. Current staff are *“the keepers of all the information.”* Many participants noted that training and knowledge sharing would be beneficial to preserve progress and help sustainability *“make sense”* to more staff. Participant 2 at Hospital B noted the opportunity to train dietetic students placed in their institution about the benefits of sustainable food interventions for patient care.

Several change management strategies at Hospitals A and B were identified as beneficial for staff engagement and knowledge sharing. Participant 2 from Hospital A identified that: *“Entering into conversations with curiosity... being patient... (and) using a hands-on approach”* to collect ideas and feedback from staff contributed to *“collective learning”* and the development of shared understandings. Furthermore, *“baby stepping forward... (and) slow transitions”* were key to helping staff adjust: *“Small changes for big wins.”* This participant indicated that success wasn’t immediate. It takes *“ongoing work.”* Participant 1 from Hospital A shared that sentiment: *“Oh, we’re still learning.”* Participants from Hospitals A and B described the implementation process as a *“journey,”* and *“constant cycle.”* Long-term thinking was essential, according to participant 2 from Hospital A. They shared that upfront costs could bring a return on investment, and savings in one area could compensate for higher costs in others. *“It’s about looking into the future and saying, is this okay in the big picture in the long run?”*

Participants from Hospitals A and B additionally identified the critical advantage of iteration for change management. Participant 2 from Hospital A described the commitment required for interventions to be successful:

“It’s time and iteration. It’s not about kicking the bucket and it’s done. This doesn’t work. It’s about understanding why... just because this recipe didn’t work, it doesn’t mean that they’re all not going to work. It means we shift and we try something new.”

Participant 2 from Hospital B shared an example of how a challenge was resolved through iteration. Culturally inclusive items that had been made available upon request were being wasted. One of the myriad reasons was that items had to be purchased in bulk. In response, foodservice trialed adding a small portion of the culturally inclusive item to the regular menu, which used most of the bulk purchase while leaving some of the item to be frozen and available for requests. This adaptation addressed many of the reasons for the wastage, including making staff and patients aware of the item's availability. The item is now a consistent, well-liked component of the menu and there is limited wastage.

In contrast, participants at Hospital C, the comparative institution with less evidence of progress toward sustainable food, described some change management strategies, such as knowledge sharing with clinical dietitians about new food items, as well as adapting procurement orders to receive common items in bulk, portioning, and freezing to reduce spoilage. Yet, participants noted that barriers related to the foodservice model and infrastructure limitations stop them from developing or implementing more sustainable interventions. Despite describing motivation to implement more interventions, short-term, simple interventions seemed to dominate until a new hospital building could be constructed. Reflecting on this, Participant 1 from Hospital C stated:

"The hospital is quite old. Everything could be done with a little bit of tweaking. Everything could be changed, but the hospital structure, it is not designed to change the cooking. We will get a full-size cooking kitchen when we have a new hospital built, but we never know when that will happen. All we can do is just expand portioning in-house."

Participants at Hospitals A and B explained that many aspects of change management were not included in healthcare training, nor were they common in efficient systems. Participants 2 and 3 from Hospital A identified that iteration requires *"creativity," "flexibility," and "time."* Participants indicated that external partnerships were *"instrumental"* to overcoming such challenges. Nourish, a not-for-profit

organization supporting healthcare institutions in Canada to implement sustainable food, was explicitly noted to be beneficial. Participant 1 from Hospital B stated,

"There would be a lot of discussion and planning, but then to move forward was difficult... Nourish pushed us to do some of the things and see how it goes ... stop thinking and start executing."

Participants at Hospitals A and B noted that Nourish also helped them gain an appreciation for the multidimensional aspects of sustainable food, driving projects with diverse goals. Participant 2 from Hospital A appreciated support with learning change management, setting goals, and developing project plans, as well as the connections to resources. This participant also described how positive media attention from the Nourish partnership led to recognition and extended funding. According to participants and documents from Hospital A, other external organizations helped manage the on-site garden and extended its benefits beyond patient foodservice, such as a gardening program for mental health patients. Unlike Hospitals A and B, participants from Hospital C did not identify external partnerships relevant to sustainable food efforts. Further, participants focused sustainable food interventions on reducing food waste rather than interventions with multidimensional benefits.

According to participant 2 from Hospital A, implementing interventions was not straightforward or easy. However, change management strategies seemed to maintain the commitment necessary to see progress. This participant reflected on the journey:

"There's some things that work, there's others that don't. I don't know if you get there 100% of the time. It's tricky. It's tough. Keep the cycle going to get to a point that you can be proud of. It's part of the normal process now. It's painful at the time. It's the time and energy that I think are sometimes a barrier, but if you keep progressing and moving forward, it's very rewarding once you start to see change happening."

Documents from Hospital A confirmed this participant's perception that sustainability is becoming embedded into daily work:

"Sustainability is embedded in ongoing efforts across care delivery... small changes and continuous learning... (it is) not a one-time change, it's something we continue to improve step by step."

Nonetheless, it will take long-term change management, as participant 3 from Hospital A cautioned, *"It's a huge task to shift an entire organization's perspective."*

The power of change management strategies appeared to stem from the cultural-cognitive pillar of Institutional Theory. Cognitive frames and social narratives seemed to require restructuring to accommodate sustainable food within the complex environment of patient care. However, capability, opportunity, and motivation constructs within the individual domain of CFIR, as well as constructs within the inner setting domain, were applicable yet seemed inadequate to capture the complexity of the process.

5.4.4 Development from the bottom-up

Participants at Hospitals A and B stressed how *"making sense,"* and managing change were largely driven through development internal to foodservice rather than from top-down processes. As participant 3 at Hospital A, the exemplar institution, indicated,

"When we added sustainability, it didn't go to anyone outside (of foodservice) for input... We were able to feel it out, try different things, learn as we go... our goals were self-defined."

Documents from Hospital A describe an overarching strategic commitment to sustainability and to being anchors for the long-term health and well-being of the community. Participants at Hospital A indicated that senior leadership was supportive of sustainable food interventions, including temporarily approving

dedicated time for implementation. However, participant 3 from Hospital A suggested that if efforts had been driven by senior leadership directives from the top down, *“It would have been less exploratory... we would have been chasing a number.”* This participant described that another benefit of driving implementation within foodservice was tailored messaging for foodservice staff, improving their engagement and ability to *“make sense.”* External partnerships were described as providing resources, such as change management knowledge and access to individuals with sustainable food knowledge and skills, that may have otherwise been facilitated by senior leadership participation.

Participant 2 at Hospital B, the comparative institution with more evidence of progress toward sustainable food, similarly noted that alignment with strategic plans, which indicate commitment to environmental sustainability and stewardship, was *“helpful,”* but not the driving force. Instead, this participant described that foodservice took the initiative to pursue sustainable food interventions without the explicit direction or involvement of senior leadership, the sustainability team (which is external to foodservices), or any of the sustainability subcommittees described in documents from Hospital B. Despite overarching strategic commitments to sustainability and a formal Sustainability Plan indicated in documents, participant 2 from Hospital B expressed, *“Don’t wait for it to trickle down from the top, it won’t.”* Similar to Hospital A, participants from Hospital B described leveraging external partnerships rather than top-down resources. Participant 2 from Hospital B identified that Nourish, rather than the institutional sustainability team, provided *“a lot of ideas”* for improving the sustainability of foodservice.

Documents from Hospital C, the comparative institution with less evidence of progress toward sustainable food, similarly indicate an overarching strategic commitment to sustainability, successful energy and water conservation projects, and departmental interventions such as recycling and reuse of medical supplies. Yet, foodservice at Hospital C is managed by a third-party organization. The alignment

with leadership directives, which was “helpful” for “making sense” at Hospitals A and B, does not appear to have translated to foodservice at Hospital C. Participant 1 from Hospital C indicated:

“I haven’t heard a lot from the hospital. It’s more about what we are doing within our practices.

The (third-party management) has their own people coming, so they keep an eye.”

Institutional management seemed not to have an active role in foodservice, including not applying institutional strategic commitments or policies. Foodservice reported to the third-party manager. Documents from the website of the third-party management also indicate overarching commitments to sustainability and several corporate sustainability projects. Yet, participant 1 at Hospital C reported limited success beyond waste reduction interventions. Other potential sustainable food interventions were described as “more fundamental... (and) not easy wins” by Participant 2 from Hospital C. Both participants at Hospital C reported how their role is complicated by a history of repeated staff turnover, which has constrained the development and implementation of changes. In contrast to Hospitals A and B, participants from Hospital C did not describe leveraging external partnerships to provide needed resources for sustainable food interventions.

At Hospitals A and B, the success of bottom-up development seemed to stem from the cultural-cognitive pillar of Institutional Theory. Cognitive frames and social narratives within foodservice appeared to be more influential than top-down policies or rules forcing compliance. However, at Hospital C, it was more complicated. A combination of barriers stemming from the regulative and cultural-cognitive pillars of Institutional Theory appeared to limit the development of sustainable food interventions.

Nonetheless, multiple participants across the three institutions identified accreditation standards as a top-down driver that could be a possible facilitator. Healthcare accreditation is a voluntary evaluation by a not-for-profit organization according to internationally recognized quality

standards, which currently do not include sustainable food criteria.¹⁰⁰ Despite being voluntary, most healthcare institutions seek accreditation.¹⁰⁰ In response to how accreditation standards for sustainable food would influence action, Participant 2 from Hospital A commented,

“It’s a powerful plug... it could definitely facilitate action... accreditation standards are held very highly. You’re definitely going to get healthcare leadership and everybody who wants to meet these standards looking at it. Everyone looks at them.”

Participant 2 from Hospital B called accreditation *“incredibly important... it’s kudos for the hospital... it would push (hospitals) to do more,”* while participant 2 from Hospital C explained that measurable indicators would *“bring it more to the forefront”* and motivate institutions to explore sustainability possibilities.

The potential of accreditation standards seemed to stem from each pillar of Institutional Theory. Accreditation is not mandatory according to law; however, it is normatively prescribed, presumed by social narratives, and reinforced by institutional policies.

5.4.5 “The patient voice is at the center of what we do.”

Participants at each institution repeatedly mentioned that improving patient health and wellness was a driving force for usual and new practices, which seemed to stem from the normative pillar of Institutional Theory. Two dietitians from Hospitals A and B reported that their training led to an intuitive understanding of the benefits of sustainable food for achieving such goals. They explained that plant-based foods provide fibre, vitamins, and minerals, and are critical components of therapeutic diets addressing multiple illnesses and injuries. In addition, documents from Hospital A stated, *“food is medicine... (that) can propel us towards a healthier and better future.”* Participants at each institution beyond dietitians similarly described food as medicine for healing.

Yet, at the same time, participants explained that patient preferences take precedence over other foodservice goals. Participant 3 at Hospital A expressed, *“The patient voice is at the center of what we do.”* That value was described as overshadowing professional codes of practice and mandates to promote health. Participant 2 at Hospital A described this dichotomy as a barrier to healthy eating before sustainability became part of foodservice goals.

“If you are not eating, eating is number one, and then optimizing what you are eating is number two... at the end of the day, if we serve a perfect tray and the patient isn't eating it, what's the point?”

Participants at Hospitals A and B expressed that preserving patient choice, regardless of health or environmental implications, helps ensure patients eat. When asked about their perception of default plant-based menus in hospitals in New York, participants expressed that their patient population is not *“ready”* for such a change. *“You would lose the sustainability message,”* if restrictions on patient choice were introduced, according to participant 2 from Hospital A. While patient appreciation of the sustainability message is not required, it would be beneficial for patients to learn from the role-modelling behaviour of foodservice in healthcare and change their own behaviours.

A common story across institutions was that patient preferences do not align with sustainable food, which appeared to stem from the cultural-cognitive pillar of Institutional Theory. Participant 2 from Hospital B summarized patient preferences as: *“Don't take my burger away.”* Participant 3 from Hospital A indicated that patient preferences are a barrier to reducing GHG emissions from patient menus: *“The biggest emissions contributor is beef, and beef is the most well-liked item. It's hard to remove.”* Participants from each institution shared similar stories about meat and potatoes being the preferred patient choices. Yet, patient preferences can also act as a facilitator. Participants at Hospital A described

how positive patient feedback has contributed to the expansion of an on-site garden where fresh produce is grown for patient meals.

The diversity of the patient population complicates how sustainable food interventions are received. Documents from each institution describe a wide range of patient care, including surgery, emergency, veterans, mental health, rehabilitation, and long-term care. Participants from each institution described the diversity of their patient population. Participant 1 from Hospital A commented,

“We have older gentlemen who, if we serve them broccoli grown in the garden, they're like, I don't want broccoli. Don't ever serve me this. Or we could have someone with an acute brain injury who's like this was grown on site? This is incredible... we get a wide variety of feedback.”

Participant 2 from Hospital A described the large volume of feedback collected from patients, typically from the *“loudest voices,”* complicating efforts to maintain patient satisfaction while implementing sustainable food interventions.

Meanwhile, participants identified that the efficient system limits the ability to provide different meals to different patient populations. Participants from Hospitals A and B noted that only one kitchen at one campus has capacity for in-house cooking, with limited space and skilled chefs available. Comparatively, Participant 1 at Hospital C noted the challenge of adding a variety of sustainable meals to the restaurant-style menu to suit diverse tastes. Individual meals have a limited expiry. If meals are not chosen by patients, they are wasted. The third-party manager is paid by the hospital based on the number of patients requiring meals per day, not by how much food is ordered. Thus, any wasted food is a cost absorbed by the third-party manager, leading to a decision to procure mostly *“popular comfort food.”*

The need for sustainable food interventions to *“make sense”* could logically be extended to patients and the community. However, participant 1 from Hospital A stated,

“You can suggest to patients until you’re blue in the face, but you just come up to a wall where people don't want to change... they can't see the benefit to even small adjustments.”

This sentiment was echoed by participant 2 at Hospital C; the best foodservice can do is *“offer the sustainable choice.”* Participant 2 from Hospital B commented that the institution has *“somewhat of a responsibility, but sustainability is an individual’s responsibility.”*

The power of the patient voice in foodservice decisions seemed to stem from the normative pillar of Institutional Theory. Participants valued patient health and patient choice over sustainability. Meanwhile, the power of patient preferences for less sustainable options, such as meat and potatoes, seemed to stem from the cultural-cognitive pillar wherein social narratives about meat and comfort food influenced patient feedback to sustainable food interventions.

5.4.6 A disconnected food environment

Participants described varying food options for staff and visitors across the three institutions. The cafeteria at Hospital A, the exemplar institution, was managed by a third-party organization, not patient foodservice. Participants described some sustainable food interventions within that cafeteria. For instance, leftover food was donated rather than wasted, and there were plant-forward and culturally inclusive options. Yet, several participants reported that the food was expensive. Participant 1 from Hospital A identified equity implications for staff in lower-paying jobs, *“A \$7 sandwich or not eating, those are choices you don’t want to have to make.”* Participants noted that other food vendors, such as the gift shop and vending machines, offered cheaper alternatives but were not considered healthy options. Participant 3 from Hospital A expressed, *“They’re going the easy route with food that sells... the focus is not on sustainability or health.”* Yet, documents indicated staff wellness was a strategic goal of Hospital A, which participant 3 noted could be achieved through ensuring sustainable food options on-site.

"It would be nice if it wasn't a profit-driven business in the cafeteria... more about supporting the workforce and an external company wasn't profiting."

Participants would only speculate about why Hospital A had chosen to outsource staff and visitor food options, citing reduced management workload and cost as possible reasons.

Documents from Hospital B, the comparative institution with more evidence of progress toward sustainable food, stated that improving staff wellbeing was a primary quality improvement project with leadership support and direction. Hospital B's website described:

"Plant-forward and person-centred menus (which) are underway in cafeterias to create healthy and sustainable food options for patients, visitors, and staff."

Participants from Hospital B noted that the hospital-managed cafeteria cooks in-house and did have some plant-based and culturally inclusive options. Yet, participant 1 from Hospital B indicated that foodservice had not engaged the cafeteria as part of sustainable food projects. *"It hasn't been looked at, but there is that real possibility... that we could engage in altering their menu."* Additionally, this participant indicated the cafeteria had skilled chefs, offering an opportunity to collaborate to improve the sustainability of patient meals. Participant 2 from Hospital B expressed that the second cafeteria, managed by a third-party organization, was *"expensive and profit driven."* Participants additionally described the multiple vending machines available at Hospital B with packaged, processed foods, such as instant noodles and pizza, as not contributing to health or environmental sustainability.

Documents from Hospital C, the comparative institution with less evidence of progress toward sustainable food, identified a Wellness Department as part of a quality improvement project to strengthen staff health and wellness. Despite this commitment, Participant 1 from Hospital C indicated the cafeteria was not managed by the hospital, but by the same third-party organization as patient foodservice (but separately). Nutrition seemed not to be included in the hospital commitment to staff

health and wellness. This participant furthermore noted that, unlike patient foodservice that lacked any kitchen infrastructure, the cafeteria had a kitchen with in-house cooking. Participant 2 from Hospital C commented that, despite the age of the building, which had been noted as a significant barrier to change in patient foodservice, the cafeteria had recently been renovated at the expense of the third-party organization. Participant 2 commented, *“I guess there’s more cost benefit to revamp for the retail operation.”* Nevertheless, neither participant characterized the staff and visitor food options in the cafeteria as healthy or sustainable. Participant 2 reported that single-use plastics were available, while composting and recycling were not. Healthier options were reported as being expensive, while the *“cheap eats”* were less healthy.

The disconnections noted by participants between patient foodservice and food options for staff and visitors appeared to stem from the regulative pillar of Institutional Theory. Policies and rules related to outsourced management and market forces seemed to dictate over normative values or social narratives about staff wellness before profit.

5.5 Discussion

Using in-depth interviews with individuals working in foodservice, we explored barriers and facilitators to sustainable food interventions in an exemplar healthcare institution and two comparative institutions with different levels of sustainable food implementation. Interviews were supported by a review of relevant documents, including institutional strategic reports. Generated themes included efficiency meets sustainability, making sense of sustainable food, making sense through change management, development from the bottom-up, *“the patient voice is at the center of what we do,”* and a disconnected food environment. The theoretical framework that we developed for this study, drawing on CFIR and Institutional Theory, was valuable for considering how implementation occurs across the five domains of CFIR, and how barriers and facilitators acted through multiple pathways, at times

simultaneously.¹⁰¹ The strongest barriers originated from the regulative pillar of Institutional Theory, and the strongest facilitators stemmed from the cultural-cognitive pillar of Institutional Theory.

Individual factors identified as barriers, including budgetary considerations and the drive for efficient foodservice models, aligned with prior research.^{40,63,64 33,42,50,53,102} Other factors stemming from the regulative pillar of Institutional Theory, such as policy and provincial funding, were identified in prior literature as facilitators and as necessary conditions to begin the implementation process.⁶³ Our study suggested that top-down mechanisms, such as institutional policy, were helpful, but not sufficient for sustainable food implementation. Despite legislation in other countries,^{36,38,52} there are no mandates in Ontario, only recommendations that do not force foodservice compliance or act as positive feedback channels reinforcing change toward sustainable food. Therefore, it is not possible to study the specific impact of provincial policy within the Ontario context.

Many of the strongest facilitators, including staff engagement, communicating rationale, slow transitions, and external partnerships, also aligned with prior research.^{27,37,42,50,102} At the exemplar institution and the comparative institution with more evidence toward sustainable food, making sense of the innovation through change management was a continuous cycle of adapting the innovation and implementation process to the changing context, a cycle that was embedded into regular roles and responsibilities. We had identified adoption as the implementation outcome in our study. However, we learned there was no endpoint to the implementation process, as sustainable food was embedded into everyday practice. In contrast, participants at the comparative institution with less evidence toward sustainable food did not identify similar stories of making sense of how sustainable food fit within their context or instances of using change management strategies, such as iteration, to help adapt interventions to fit within the context. Participants did acknowledge that if and when interventions made sense, they would be explored.

Change management strategies have been used in healthcare to improve quality care in teams, institutions, and larger health systems.¹⁰³ Several formal models drawn from management studies, such as the Kotter, Lewin, and LEAN change management models, have been documented as useful guides for healthcare by outlining the stages of successful change in an organizational context.¹⁰³ Many such models include translating the rationale for change for diverse actors, especially clinical care, to improve buy-in or create an “enabling culture”, aligning with our theme of making sense through change management.¹⁰³ Our findings about making sense through change management resonate with a recent assessment of factors necessary to normalize a climate lens in Canadian health services, which suggested that sensemaking involved recognizing climate as a health issue, reframing usual work as climate work, and gaining new, emerging skills.¹⁰⁴ Similar change management strategies were also cited as facilitators for a transition to healthy and sustainable food practices in a hospital cafeteria in 2011.⁴⁹ More recently, a study of three exemplar hospitals in the Netherlands suggested change is facilitated by communicating ‘the why’ and tailoring the message to different audience needs across the institution.⁵² The study further suggested change is a slow, continuous, and constantly evolving process,⁵² aligning with our findings. The investigated institutions, however, were all exemplar institutions provided with direction and identified goals from a national program created to achieve government targets.⁵² Successful institutions in our study drew motivation from within foodservice and support from external partnerships to make sense of sustainable food, factors that were not evident in the comparative institution with less evidence toward sustainable food. While siloed leadership, clinical care, and foodservice have been cited as barriers to change in other research,^{27,53,102} focusing on finding meaning within foodservice before turning attention to the broader institution was viewed as a successful strategy by participants in our study. Research in an international context has similarly suggested that exemplar institutions related to sustainable food took initiative to achieve self-defined goals.⁵⁰ However, exemplar institutions in that study were a mix of public and privately funded institutions in various social

and political contexts.⁵⁰ Within a more similar context to the institutions in our study, healthcare providers in Québec, conversely, felt sustainable food should be a policy priority, supported by government mandates, increased funding, and the development of tools, such as sample menus or recipes.⁶³ This discrepancy could be related to provincial differences in how sustainability is normalized and implemented in health systems, as identified by prior research.¹⁰⁴ Nevertheless, other institutions in Ontario, including the comparative institution in our study with less evidence toward sustainable food, could draw inspiration from the experiences at the other institutions to overcome the perceived need for *a priori* policy and leadership direction to move forward with implementation, understanding that it will be a dynamic, iterative journey.

Prior research has highlighted that external partnerships with not-for-profit organizations acted as “bridging factors” by providing missing resources, rather than relying on policy or leadership.^{27,104} Institutions in our study likewise developed external partnerships to provide knowledge, skills, and connections not common to efficient healthcare systems, rather than relying on top-down direction. Foodservice in the institutions we studied seemed to be designed for efficiency and immediate patient needs, while sustainable food interventions required reflection, creativity, and time. External partnerships provided connections to kick-start creativity and momentum, as well as change management support, resources that were instrumental to helping reframe foodservice and make sense for institutions in our study with success implementing sustainable food interventions. External partnerships also seemed to instill a more holistic understanding of sustainable food, which was not observed in the comparative institution with less evidence toward sustainable food. As described earlier, we conceptualize sustainable food holistically, integrating environmental, health, economic, and social dimensions, valuable for appreciating the systemic nature of sustainable food, streamlining goals, and conserving scarce natural, human, and financial resources.^{75,76}

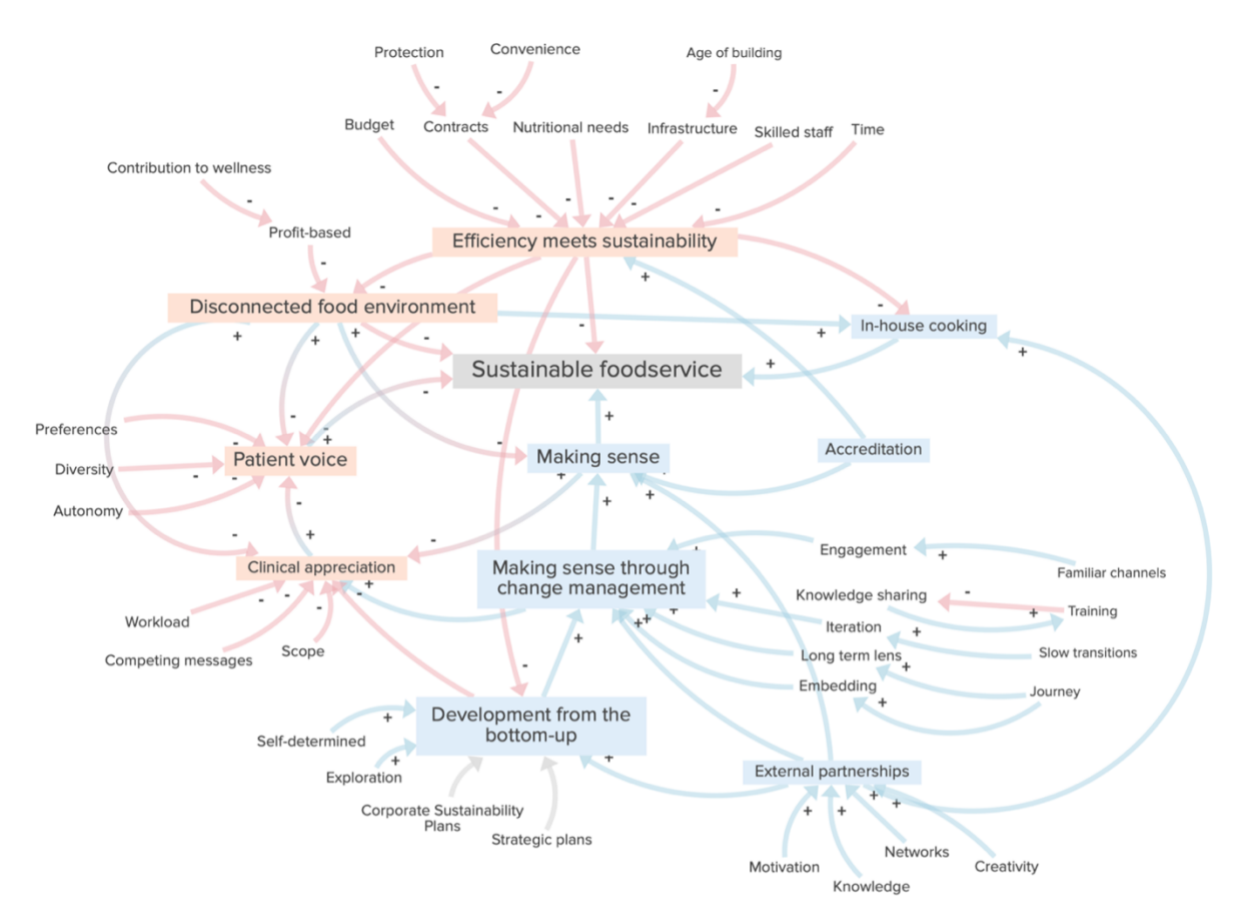
Institutions in our study face challenges to expanding sustainable menus from patient resistance, potentially attributable to social narratives about meat consumption and comfort foods. Contradictory evidence exists in prior research about patient support for removing animal-based foods in favour of plant-based. Studies in European healthcare institutions suggested patient resistance is a barrier to the implementation of plant-based menus.^{42,52} However, other studies have reported high patient satisfaction with default plant-based meals and hypothetical patient acceptance of removing red meat in discrete choice experiments.^{105,106} In our study, the normative pillar of Institutional Theory helped theorize why patient resistance is such a formidable challenge for healthcare staff. The primacy of the patient voice and autonomy seemed to act as a negative feedback channel constraining change toward sustainable meals that may be unfamiliar and not well-received by patients. A survey of international clinical dietitians likewise suggested a predominant concern for patient goals over sustainability objectives.⁵³ Prior research has highlighted debates about the normative role of healthcare related to individual behaviour change in international settings.^{52,102} Our study suggests such concerns extend to healthcare staff in Ontario outside of clinical care and dietetics. Our exemplar institution continues to use change management strategies, such as slow transitions and a long-term perspective, to dampen the negative feedback channel of patient resistance over time. Future research could evaluate whether these strategies have been successful.

Despite consistent commitments to staff wellness in documents, patient foodservice seemed to be disconnected from food options for staff, visitors, volunteers, and healthcare students in the institutions in our study, stemming from the regulative pillar of Institutional Theory. Valuing staff wellness over profit and finding meaning in sustainable food, stemming from the normative and cultural-cognitive pillars, could facilitate expanding patient foodservice interventions to staff and visitor food options, which are integral components of the food environment within healthcare institutions.³⁵ The systems-based approach used in this study highlights the opportunities and challenges within this part of

the system. Hospital-managed cafeterias have additional infrastructure and skilled staff that could support weakening negative feedback channels which reinforce efficient foodservice systems. Shifting staff and visitor food options could offer a further opportunity for knowledge sharing and supporting staff and patients to make sense of sustainable food, strengthening the positive feedback channel offered by patient satisfaction, which was identified by participants at the exemplar institution for encouraging the on-site garden.

The application of a systems-based approach in this study demonstrated the complex ways in which identified barriers and facilitators interacted, combined, and acted as feedback channels to either constrain or reinforce, and in some instances both constrain and reinforce, change toward sustainable foodservice (Figure 5). Individual factors, such as budget, contracts with food distributors, and limited, aged infrastructure, combined to drive foodservice toward efficient systems. This drive toward efficiency interacted with patient preferences favouring comfort and animal-based foods, limited clinical appreciation of the benefits of sustainable food for patient care, and the disconnections between food provision options undermining efforts to position food as a tool for health to create strong negative feedback channels constraining change toward sustainable foodservice. These feedback channels were evident at each institution in our study. Making sense of sustainable food's role in patient care through change management strategies, such as translating the holistic why for different roles, continuous iteration of interventions to fit the changing context, and embedding for long-term goals, combined to reinforce change toward sustainable foodservice. Bottom-up development within foodservice supplemented by external partnerships also contributed to these feedback channels. Such feedback channels were most evident at the exemplar institution and the comparative institution with more progress.

Figure 5. Systems map illustrating interactions and collective effects of individual barriers and facilitators either constraining or reinforcing change toward sustainable foodservice ^h



^h Red connections represent barriers constraining change toward sustainable foodservice. Blue connections represent facilitators reinforcing change toward sustainable foodservice. Red and blue connections represent both barriers and facilitators. Grey connections did not seem to have a meaningful effect. Made with Kumu (Gitbook, Covina, California, United States).

Factors such as patient preferences may play a dual role as both barriers and facilitators. Within a complex adaptive system, factors interact with one another to become more than the sum of their parts.¹⁰⁷ In complex adaptive systems, such as healthcare, the relationships between factors are dynamic, unpredictable and non-linear.¹⁰⁷ For example, the factors necessitating efficient systems, such as budgetary, time, and staffing constraints, not only affect foodservice but also clinical care, limiting the capacity of clinicians to appreciate the benefits of sustainable food for patient care. Meanwhile, the same budgetary, time, and staffing constraints put pressure on clinical staff to check as many boxes as

possible, reinforcing the push for efficiency. These relationships are dynamic, wherein their intensity changes based on context. The COVID-19 pandemic resulted in staffing shortages and increased funding to healthcare,^{108,109} whereas a recent economic downturn has resulted in reduced funding and staffing cuts,^{110,111} the effects of which would be context dependent and unpredictable. Given the complexity of the relationships in complex adaptive systems, there may also be unintended effects of staffing and funding changes on the health and wellness of remaining staff, possibly impacting their capacity to participate in interventions such as sustainable food. Implementing an education intervention for clinical staff about sustainable food to overcome the individual barrier of a lack of appreciation would not address the complexity of these relationships and would be inadequate for overcoming the combined effects. The complexity inherent in healthcare and practice change reinforces the need for a systems lens that does not view implementation as a linear, predictable, and prescriptive process, but rather, incorporates relationships, unpredictability, and the effect on the whole system.¹⁰⁷

At times, CFIR was not suited to adequately capture the experiences of the institutions in our study, specifically, why making sense and change management facilitated success. Embedding sustainable food into everyday practice was not represented in the implementation domain of CFIR. Existing constructs within the inner setting and individual domains of CFIR seemed inadequate to capture the nuances of how different individual and collective values and beliefs interacted to influence a unified understanding of sustainable food's contribution to patient care. Constructs from Normalization Process Theory such as coherence and cognitive participation may be more helpful for theorizing making sense, while normative and relational restructuring may resonate with why a change management process was effective for making sense.¹¹² Sustainable food is an emerging intervention in healthcare, whose values rooted in patient care are not easily connected to the benefits of sustainable food, and may be difficult to align with standard implementation frameworks.^{52,113} The unique factors associated

with the implementation of sustainability interventions could be integrated into CFIR, similar to how equity considerations were integrated in 2022.¹¹⁴

5.5.1 Practice implications

Our findings have multiple implications for foodservice practice. If patient preferences begin to shift, patient satisfaction could be leveraged as a positive feedback channel to reinforce change. For example, positive responses to in-house recipes could serve as the rationale for reallocating resources toward more in-house cooking, which was an identified facilitator in our study for providing more flavorful meals that patients preferred while integrating more culturally inclusive and plant-based foods. Prior research has likewise described in-house cooking as a facilitator for transitioning to healthy and sustainable food environments in Dutch institutions.⁵² External partnerships could provide missing resources, such as skilled chefs required to design and iterate more complex recipes, the lack of which was identified as a barrier to expanding in-house cooking in our study and prior research.^{50,52}

Helping clinical staff, including clinical dietitians, physicians, nurses, and allied health professionals, make sense of the innovation through change management strategies could facilitate patients doing the same. The expertise of clinical staff is valued by patients and their families for health promotion.^{27,53} Participants from institutions in our study with more evidence toward sustainable food suggested that connecting more strongly to health messages, such as the power of food as medicine, would enable clinical staff to make sense of sustainable food. Sustainability and planetary health training for healthcare practitioners was recommended in prior research for encouraging leadership from clinical staff.^{27,50} Our results suggest sustainability and planetary health would need to be more strongly connected to motivators relevant to everyday practice. Moving beyond communication and education to a multi-pronged change management process aimed at creating a shared understanding of sustainable food within the allied healthcare community could spur progress toward sustainable food. Training for

new staff and healthcare students related to sustainable food could contribute to embedding sustainable food interventions within usual practices and sustaining implemented interventions. It is essential to consider the systemic nature of individual factors acting interdependently and dynamically as feedback channels; single interventions may not produce measurable or meaningful change.

5.5.2 Policy implications

Our findings also have policy relevance. Participants described healthcare accreditation as a promising policy implication. Our findings and previous research suggested that the process of gaining exemplary accreditation standing drives significant leadership direction, resource allocation, and commitment across the institution.^{115,116} The self-assessment component and recommendation report within the accreditation process could offer promising opportunities for staff and leadership across departments to develop shared understandings of the value of sustainable food in quality patient care.¹⁰⁰ The incorporation of sustainability indicators, such as the proportion of plant-based vs. animal-based meals or volume of organic waste composted, in accreditation standards could effectively align normative, cultural-cognitive, and regulative pillars of Institutional Theory, as accreditation is already “taken for granted, normatively endorsed, and backed by authoritative powers.”^{84, p. 71} Interventions driven by a combination of normative, cultural-cognitive, and regulative forces have been deemed “formidable” forces for change.^{84, p. 71} Changing accreditation standards could be the system change needed to trigger a tipping point leading to fundamental, self-sustaining systems change.^{76,77}

5.5.3 Strengths and limitations

This study provides insights into barriers and facilitators that helped an exemplar institution implement sustainable food interventions and how these barriers and facilitators interacted. Comparisons to two additional institutions with differing levels of evidence toward sustainable food provided additional

insight into the factors and processes most influential in real-world settings, potentially transferable to other institutions in a similar political and social context.

A theoretical framework combining CFIR, Institutional Theory, and prior research grounded new findings in preexisting knowledge and theory. Reflecting a systems-based approach, the theoretical framework was leveraged to highlight interconnections and nuances, as well as explain how and why factors collectively acted as feedback channels constraining or reinforcing change. We applied the theoretical framework in a flexible approach and made recommendations for alternatives when the framework did not align with the experiences of the participants in our study, contributing to the evolution of implementation frameworks based on practice in real-world settings.¹¹³ We followed a systematic framework analysis method based on prior research,^{94–96} as well as the Big Q Qualitative Reporting Framework,⁹¹ providing congruence across the philosophical assumptions, methodology, methods, and analysis.⁶⁸

The findings should be interpreted within the context of their limitations. Perspectives represent select individuals who may not represent the experience of others within the same or other institutions. We did not aim to collect a static, single reality, but rather, an interpretive understanding between the collected data and the researchers, consistent with our epistemology assuming the situated and constructed nature of knowledge.^{67,68} We do not claim data saturation; additional perspectives will provide more insight.^{73,117} Cases were purposefully chosen based on our scoping research⁴⁶ and consultation with a knowledge user, potentially favouring the researchers' preconceived notions.¹¹⁸ Preconceived ideas were explicitly tested in interviews and in some cases, challenged the first author's expectations arising from their nursing experience and public health training,¹¹⁸ such as the belief that policy changes and strategic commitments would be strong facilitators for change. Sequential data collection across the three institutions and iterative data collection and analysis enabled interrogating alternative interpretations of key influential processes identified at the exemplar institution.^{97,118} Themes

were not validated by participants, though follow-up interviews with two individuals provided the opportunity to interrogate understandings.

The inclusion of different cases may have identified contrasting experiences. The insights are specific to those from participants predominantly working in foodservice, despite intentions to include diverse perspectives. The sample was limited to individuals recommended by initial contacts at each institution and did not include participants from senior institutional leadership or clinical care. It would be beneficial to explore how individuals outside of foodservice make sense of sustainable food, as well as the engagement and knowledge sharing methods that would be most impactful to mitigate some of the negative feedback channels, such as the lack of appreciation of the clinical relevance of sustainable food.

We did not observe patterns in the results across sociodemographic characteristics. While the sample was predominantly from foodservice and identified as female, varying racial and ethnic identities as well as age ranges and professional roles were represented. Perspectives from varying gender, racial, and ethnic identities; professions; and other regions of Ontario would be insightful to build on the results of this study. Exploring experiences in different political and social contexts and through the lenses of differing identities is a valuable avenue for future research to illuminate how context and power shape multiple realities, to challenge our own cognitive biases, and to enable continuous learning,^{74,75} especially since shifting social narratives and cognitive frames were identified as a pathway to change, which would be influenced by power dynamics.

Recruitment challenges at the comparative institutions limited our ability to develop an in-depth understanding of these institutions. Access to cases is a common concern in case study research, limiting a holistic understanding.⁸⁹ Future research could focus on these institutions to gain more perspective on their implementation of sustainable food. A key finding was the iterative nature of sustainable food

projects requiring continuous adaptation. However, we captured data at one time point rather than longitudinally. Future research could examine how key processes identified in this study evolve over time and the impact on implementation. Lastly, we did not assess the outcomes of discussed sustainable food interventions. For the purposes of this study, adopted interventions that had not been discontinued were considered to indicate evidence of progress toward sustainable foodservice. Future research could evaluate the outcomes of interventions to measure success.

5.6 Conclusion

We explored barriers and facilitators to sustainable food implementation at three healthcare institutions at varying stages of sustainable food implementation, identifying how these barriers and facilitators interacted to create processes that constrained or reinforced change across the three institutions. This exploratory work suggests that creating opportunities for integrating individual and collective values and beliefs with sustainable food can help make sense of how sustainable food interventions are beneficial for patient care. Change management strategies, such as cultivating staff engagement, translating the holistic why, planning slow transitions, managing cycles of iteration, and embedding for long-term goals, could enable collective learning and the adaptation of interventions to align with the changing context. External partnerships could be instrumental for overcoming policy inertia and compensating for the lack of resources in an efficient healthcare environment focused on immediate patient needs. Accreditation standards incorporating sustainable food indicators could be a promising policy avenue for leveraging normative, cultural-cognitive, and regulative forces to enable staff across the healthcare institution to find meaning in the benefits of sustainable food for patient care.

Crucially, this study highlights the systemic nature of implementation in healthcare institutions. Influential factors can be barriers and facilitators but work collectively as feedback channels constraining or reinforcing change. Exploring the broader system simultaneously, including the myriad actors,

sustainable food interventions, and food provision options across the institution, can highlight opportunities to streamline resources, save costs, and strengthen the sustainability of healthcare foodservice across environmental, health, economic, and social dimensions. The findings provide insights into the institutions that are slowly shifting norms dictating everyday practice in healthcare foodservice. More sustainable healthcare foodservice can help to create the enabling conditions necessary for structural change in the broader health and food systems.^{76,77}

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Ethical statement

All interview participants provided prior informed consent. This study was reviewed and approved by a University of Waterloo Research Ethics Board (REB# 47909).

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Chapter 6

Reflexivity and Contributions

6.1 Summary of findings

This thesis aimed to explore barriers and facilitators to sustainable food interventions in the foodservice of three healthcare institutions in Ontario, Canada. Barriers and facilitators that influenced implementation seemed to act collectively as feedback channels in a dynamic process constraining and reinforcing change towards sustainable food. Conceptual themes of efficiency meets sustainability, making sense of sustainable food, making sense through change management, development from the bottom-up, *“the patient voice is at the center of what we do,”* and a disconnected food environment tell an interpretive story of the experiences of participants within these three institutions, potentially transferable to other healthcare institutions in similar political and social contexts.

For the participants in our study, the need for and benefits of efficient foodservice systems were viewed as barriers to sustainable food interventions. Barriers such as policy decisions, including a reliance on products from broadline distributors and reduced kitchen infrastructure, combined to function as a negative feedback channel, reportedly compelling foodservice staff to maintain efficient systems. Making sense, the cultural-cognitive process of connecting collective and individual values to sustainable food, seemed to serve to develop a shared understanding of sustainable food’s role in patient care, acting as a positive feedback channel reinforcing change toward sustainable food implementation. According to participants, change management strategies were beneficial for making sense and for continuously adapting interventions to fit within the changing context. Making sense through change management reportedly continues to be a complex learning journey facilitated by focusing within foodservice, before expanding to the broader institution. External partnerships were reported as instrumental facilitators, providing needed resources to overcome the apparent tension between the efficient healthcare environment focused on immediate patient needs and sustainable food

interventions that seemed to require creativity and time. Staff and visitor food options were identified as promising for expanding implementation by providing opportunities to share resources with patient foodservice and share knowledge with staff, patients, and their families, potentially weakening negative feedback channels maintaining efficient systems. Accreditation standards incorporating sustainable food indicators were deemed a promising policy implication by participants for weakening negative feedback channels by combining normative, cultural-cognitive, and regulative pillars of Institutional Theory to promote change. The efforts of the institutions in this study with more progress toward sustainable foodservice seemed to create enabling conditions for reaching a tipping point toward health and food system sustainability.

6.2 Revisiting the philosophical approach

Reflexivity was a central component of this thesis. Problem-solving through reflection and writing, and consulting with my thesis committee, was where my scholarship developed. I learned important lessons. The overwhelming amount of raw data during data analysis, coupled with NVivo functions that tended to generate numerical summaries when I was looking for deeper meaning, prompted me to consult with my committee. It was at this point that systems maps, reflection, and drafting became indispensable. I learned that my thinking is the most important component of analysis, not the software or other researchers' opinions about the right way to do things. I also learned that study design must be flexible and adaptable to changing circumstances, such as recruitment challenges.

In Chapter 3, I outlined my intentions to reflect on my situated knowledge, my fluid location between “insider” and “outsider”, and the potential implications of my philosophical assumptions. I also intended to question whether my findings reinforce or challenge dominant narratives and reflect on whether the underlying discourses align with or contradict my definition of planetary health and sustainable systems.

First, I have reflected on my situated knowledge and fluid location between “insider” and “outsider.” I view my subjectivity as a resource rather than a threat to the quality of this study.²⁰¹ My fluid role as an “insider” and “outsider” allowed me to appreciate multiple perspectives. As a healthcare provider, I understand the duality of wanting to provide the highest quality of care yet needing to balance that with multiple resource limitations. I remember the tension between the efficiency and speed required to attend to acute medical needs and the art of attending to the whole person. The most meaningful part of my job was the ability to slow down and sit with a patient while performing a longer task like a dressing change, when I had the opportunity to talk to the patient and really understand who they were and what they needed. Those opportunities were few and far between, but when they happened, I was able to make a real difference in patients’ lives. At the same time, my training in public health and sustainability and my role as an “outsider” allowed me to place the reality of working in healthcare within the bigger picture of environmental change and population health. My experiences and training have led me to believe that upstream, preventative strategies are needed to stop the cycle of patient admissions, quick discharges, and eventual readmissions, which will be exacerbated by increasing climate change and chronic diseases. Reducing the burden on healthcare through preventative strategies, like sustainable food, could create more opportunities for the art of healthcare, providing quality patient care.

Second, I have reflected on the implications of my philosophical assumptions, which are evident in the analysis and interpretation. As a result of my axiology, I place tremendous value on the potential for healthcare institutions to be change-makers, which may have led to an unrealistic optimism about the ability of healthcare institutions to leverage the results of this study to shift foodservice. Negative feedback channels, such as the costs, effort, and space saved by relying on broadline distributors over cooking in-house, may be too strong to overcome. Daily challenges of meeting immediate patient needs may preclude the time and flexibility to find meaning in sustainable food. Further, my interpretation may

not represent the participants' experiences. I took an active role in data analysis and interpretation, drawing upon my interactions with the participants and the document review, my prior experience in healthcare, and the philosophical assumptions discussed in Chapter 3 to generate themes, as opposed to reporting participant perspectives with an objective, neutral stance. This is consistent with Lincoln and Guba's description of the co-generation of knowledge in an epistemological sense¹⁶⁹ and was appropriate to this study because of my fluid role as an "insider" and "outsider". The interpretation is supported by an audit trail, including field notes, codebooks, analytic memos, systems maps, interview summaries, and several drafts of a framework matrix. However, the thesis offers one interpretation and, similar to a crystal, interpretations may differ over time and based on perspective.¹⁷⁴ Themes and findings were not discussed with participants; however, the follow-up interviews with two participants provided an opportunity to interrogate understandings. As part of the project's design, reports on the findings from each institution and across institutions will be shared with the participants and their institutions as an impetus for further dialogue and to potentially inform change.

Third, I have reflected on the discourses underlying the results of this study and how they align with or contradict my philosophical assumptions, including my axiology, ontology, and epistemology. The first discourse underlying the results relates to what is considered a healthcare intervention. Standard practices in the institutions I explored seemed to treat food as a service, not a healthcare intervention, aligning with prior research.^{55–59} This was evident in the present study from outsourced management of patient foodservice and staff and visitor food options, downsizing of kitchen infrastructure, and deskilling of foodservice staff, which combined into a negative feedback channel constraining change toward sustainable food. It was also reflected in the narrow definition of sustainable food. As discussed in Chapter 3, my axiology leads me to conceptualize sustainable food as encompassing four dimensions: environmental, health, economic and social. Data collection and analysis probed each dimension, including interview questions and data extraction from documents. For instance, participants were

prompted to discuss sustainable food interventions from each dimension, such as lower carbon food options, lower salt and saturated fat options, procurement contracts with local producers, and culturally inclusive food options. Participants from each institution discussed existing interventions from the environmental and health dimensions, recognizing those interventions as part of sustainable food. Economic interventions were only discussed at the exemplar hospital in relation to procurement contracts with local food producers. However, social interventions were not consistently conceptualized as sustainable food by any participants. External partnerships were cited as beneficial for expanding the understanding of sustainable food, a finding that was reinforced by the singular focus on waste management at Hospital C, which does not currently have such external partnerships. Knowledge sharing and training for current and new staff, informed by external partnerships, could be beneficial for expanding the conceptualization of sustainable food beyond commonly understood interventions, or low-hanging fruit, such as recycling and composting. While experts have called for structural transformations to both health and food systems that are more significant than shifting to more sustainable foodservice within healthcare institutions, much of the health budget in Canada is concentrated in healthcare institutions. Diverse groups within society, including healthcare workers, healthcare students, patient families, emergency room visitors, and outpatients, are exposed to the food environment within such institutions. Foodservice is more than merely the food served to admitted patients.

As institutions with large workforces, prominent social standing, and significant purchasing power, healthcare institutions have an opportunity to be anchors for sustainability and planetary health.^{80,81} As someone who places extrinsic value in healthcare and its role in society, I believe healthcare institutions have the capacity and the responsibility to be anchors within their communities. As discussed in Chapter 3, health is shaped not only by biological factors but by a system of social and environmental determinants that collectively contribute to the risk of chronic physical and mental health

conditions. I believe the broader implications of the system of social, environmental, and biological determinants of health for families, communities, and the planet must be within the scope of all health services, not only public health and primary care. Cultivating an internal sustainability culture, outwardly modelling sustainable practices, and procuring from sustainable sources would contribute to developing more sustainable health and food systems with cascading benefits for the environmental, health, economic, and social dimensions of sustainability.^{80,81} The exemplar institution explicitly committed to being an anchor for population health in its strategic report. Toward that goal, it has developed external partnerships to expand the benefits of food as medicine beyond the institution's walls. As its sustainable food journey continues, increased knowledge sharing across the institution and improved patient acceptance could contribute to being an anchor for planetary health. Willingness to participate in this study demonstrates the commitment of each institution to sharing knowledge with other institutions and the broader community, also an element of being an anchor institution.⁸¹

I have furthermore reflected on the underlying discourse about the concept of care. Nursing and feminist scholars have suggested the concept of care should be expanded beyond humans to include nature, other living species, and the planet.^{145,165} This expansion goes beyond the benefits of sustainability for human health and acknowledges the independent worth of planetary health, aligning with my axiology. Critical theorists have also suggested that high-income countries' disproportionate responsibility for environmental change and an intergenerational responsibility to leave a healthy planet should be considered by institutions in countries like Canada.^{39,145,165} One participant in this study expressed frustration with a patient's unwillingness to accept plant-based meals because emissions would not impact that patient's future. Otherwise, participants did not discuss such ethical questions in this study. Patient voice and autonomy were the predominant focus and a barrier to expanding sustainable food interventions. Yet, sustainable food may require shifting emphasis from individual needs to more collective values of population and planetary health.¹⁴⁵ Is it paternalistic to remove the

less sustainable choice, or does it promote beneficence by improving the environmental determinants of health at the population level?²⁰² Limiting individual autonomy was not an acceptable trade-off to reduce emissions and climate change for the participants in this study, promoting the core ethical principle of respect for persons,²⁰² yet conflicting with my axiology decentring humans to recognize the rights of non-humans. Can we simultaneously consider the needs of the individual and the collective, as well as efficiency and health? A feminist ethic of care would argue it is not possible to have health for one without health for all.²⁰³ I agree with this, as I value collective entities such as planetary systems, rather than prioritizing the worth of individual components of such systems. Restrictions on personal choice would be required for healthcare institutions to demonstrate a similar axiology. Alternative economic schools of thought, such as green growth advocating for sufficiency in healthcare over a “do everything possible” mindset, would qualify the level of health necessary.^{204,205} Environmental economics would shift the emphasis from efficient healthcare to sustainable wellbeing.²⁰⁵

An individualist culture, such as that in Canada, prioritizes doing everything possible for an individual to attain the highest level of health possible. For example, in my experience as a nurse, individual preferences for extraordinary measures in a medical emergency are respected, regardless of whether the resource intensity needed to resuscitate an individual with multiple comorbid health conditions outweighs the possible gains of temporarily extending that individual’s life. A more collective culture might consider the opportunity cost of using those resources in that situation versus conserving them for situations with more dispersed benefits. Specific to sustainable foodservice, resources used to improve the multidimensional sustainability of the food environment in healthcare institutions would benefit the environment, planetary health, the demand for and supply of sustainable food, and equity. However, the results from this study suggest that the tension between immediate patient needs and the flexibility, iteration, and time required for making sense would be a barrier to expanding the concept of care and ethical responsibilities within healthcare institutions. Expanding care and ethical responsibilities

would moreover challenge the reactive, curative and physician-dominated treatment of disease and require a shift toward a preventative, holistic and collaborative focus on the multidimensional determinants of health.^{14,145,206,207} Such a shift could be achieved by redistributing healthcare resources from hospitals to preventative care. However, given the current resource allocation to hospitals, and their position in society as role models for health, focusing on improving the sustainability of hospital care is a significant opportunity to improve the sustainability of broader systems, such as the food system.

Lastly, the strongest barriers in this study raise broader questions about markets and neoliberal norms, such as profit, individualism, and efficiency. Emphasizing market provision of individual needs has been acknowledged as a contributing factor toward sustainability challenges, such as climate change and chronic diseases.^{204,208} Experts have furthermore questioned whether neoliberal markets can provide sustainable health and food systems when environmental, health, and social costs are excluded from market considerations.^{6,8,205,208–211} This was especially relevant to the outsourced management of food options for staff and visitors in the institutions in this study to profit-based businesses, a policy that fails to recognize that patients, staff, and visitors are not mutually exclusive groups. Using food as medicine seemed to only apply to currently admitted patients, when staff and visitors could easily become patients, especially when food options do not promote planetary health. Moreover, the concentration of ownership amongst a handful of food corporations could limit whether increased demand from public healthcare institutions is capable of increasing the supply of sustainable foods at affordable prices.⁵² Relying on broadline distributors to provide culturally inclusive and plant-based meals is akin to relying on corporate social responsibility to provide safe working conditions or resource stewardship. Such goods will only be provided by distributors and corporations if they align with profit objectives.²¹²

Other authors have raised questions about the fundamental goals underlying efforts to make health systems more efficient to achieve environmental goals, such as reducing emissions. Efficiency

efforts aimed at providing the same care with fewer resources assume the care is necessary and appropriate, reinforcing the underlying logic and values that have contributed to sustainability challenges, rather than pointing out alternative ways to provide care, such as preventative strategies aiming to address social and environmental determinants of health.²¹⁰ Sue-Chue-Lam et al.²¹⁰ provide an example of the “counterintuitive role of efficiency,” wherein sustainability efforts in pharmaceuticals focus on reducing packaging and safer disposal measures, when a strategy such as universal paid sick leave could reduce the need for pain medication used to return to work faster post-surgery. Alternative strategies, however, challenge the structures profiting from such care.^{205,210} A participant in this study from the institution with less evidence toward sustainable food indicated that speaking the language of costs gets more attention and buy-in. It is interesting that the more successful institutions in this study made sense of sustainable food based on values, social narratives, and economics, rather than solely based on the language of costs.

I conceptualize economic health as only one dimension of sustainability, consistent with environmental economics.²⁰⁵ Addressing challenges to planetary health requires the integration of environmental, health, and social goals.^{205,213,214} Even within a human-centred, market-driven conception of healthcare, it is in our best interests to promote a clean, healthy environment and social equity.^{214,215} The results of this thesis suggest that sustainable food can make sense through pathways other than cost and profit, reinforcing the opportunity available to healthcare to instigate sustainable changes.

6.3 Revisiting the theoretical approach

This thesis was guided by systems science, implementation science, and social science. As the primary lens guiding study design, systems science provided an overarching focus on sustainable foodservice as a leverage point for transitioning to more sustainable health and food systems, and barriers and facilitators as negative and positive feedback channels. Identifying tipping points was identified in Chapter 2 as a

pathway to systems change. In this study, accreditation standards were identified as one possible tipping point for systems change; however, participants predominantly described enabling conditions for tipping points to occur, generated through making sense of sustainable food related to patient care, such as symbolism and complementarity, recognized in systems science as enabling conditions.¹⁸¹ Barriers and facilitators to systems change, identified in prior research, including market forces and social norms, were reflected in this thesis' findings.^{181,184}

A theoretical framework, combining prior research with CFIR from implementation science and Institutional Theory from social science, guided data collection, analysis, and interpretation. The theoretical framework was initially visualized as a matrix, not a system. Nevertheless, I applied a systems lens throughout the study. As discussed in Chapter 4, CFIR was chosen as it complements a systems lens, recognizing the relationships between variables and how they interact, as well as conceptualizing individuals, the inner setting, and outer setting domains within nested concentric circles. I furthermore acknowledged the interdependent nature of the pillars of Institutional Theory.

In the analysis and interpretation of the data collected in this thesis, the language of barriers and facilitators from implementation science became too narrow, despite the incorporation of systems principles within CFIR. Presenting a list of individual barriers and facilitators in the thesis findings did not resonate with my interpretation of the study data using a systems lens. A systems lens highlighted the systemic nature of individual barriers and facilitators and how they interacted to become greater than the sum of their parts. Removing one or two individual factors does not address the interconnected, collective feedback channels. This finding, which builds on previous research, was supported by the systems lens and theoretical framework and has implications for moving forward to improve the sustainability of healthcare foodservice.

As intended, the five domains of CFIR complemented a systems lens by identifying factors across different scales and how they influenced each other. Questions about the outer setting domain in the interview guide identified the insulating effect of contracts with GPOs and broadline distributors from rising oil prices and the advantages of external partnerships for overcoming regulative barriers. However, the line between inner and outer setting was ambiguous.¹⁹³ It is possible that the inner setting could have been defined as foodservice and the outer setting as the broader institution and surrounding community, especially considering the two institutions with more progress toward sustainable food focused on making sense within foodservice rather than relying on direction or participation from the broader institution. While the findings of this study may not have changed, the theoretical framework may be more useful for guiding future sustainable food implementation if the inner setting is defined as foodservice.

Several constructs from CFIR were not included in the initial theoretical framework. Constructs such as relative advantage and relative priority within the innovation domain were added to the framework during data analysis based on interview data. Perceived salience of the innovation was included in the original framework but did not capture instances in which participants believed sustainable food was beneficial yet still prioritized other goals for patient care, such as patient autonomy. Other constructs such as assessing needs, assessing context, and tailoring strategies from the implementation process domain were also added to the framework, as they were discussed by participants in relation to change management.

Concurrently, CFIR constructs did not adequately resonate with the themes of making sense of sustainable food or making sense through change management. First, embedding sustainable food into everyday practice is not a construct in the implementation domain of CFIR. Participants from the two institutions with more progress toward sustainable food indicated the value of continuing to evaluate and iterate interventions, especially once the initial project is completed. Second, neither COM-B theory

within the individual domain, nor the culture construct of the inner setting domain, adequately resonated with the cultural-cognitive process of connecting collective and individual values to sustainable food to develop a shared understanding of its role in patient care. Communication or education seemed to be insufficient for making sense. Making sense did not assume that staff were passive receivers of information, nor that messages would naturally resonate with healthcare training.⁹² Normalization Process Theory (NPT) suggests implementation requires coherence and cognitive participation, or active participation in the “work of interpreting and buying-in to a practice in relation to institutionally shared beliefs.”^{216, p. 543} Change management processes, such as active staff engagement and knowledge sharing about the holistic why, seemed essential for individuals to integrate seemingly disparate reasons why sustainable food would be important to their role in patient care. Similarly, NPT suggests normative and relational restructuring are processes that adapt the conventions of how collective work is done to accommodate the innovation within the complexity of the context.²¹⁶

Institutional Theory highlighted how factors exert influence through multiple pathways. Institutional Theory furthermore reinforced how barriers and facilitators acted collectively as negative or positive feedback channels, either constraining or reinforcing change within the system. Vendor contracts, vendor food options, foodservice models, and labour costs, stemming from the regulative pillar of Institutional Theory, combined to create a negative feedback channel, constraining change toward sustainable food. Likewise, outsourced foodservice management, procurement of individual, pre-prepared meals, reduced kitchen infrastructure, and the deskilling of foodservice staff created a strong negative feedback channel within the comparative institution with less evidence toward sustainable food, reportedly hindering the ability to provide meals customized to their priorities. The majority of the negative feedback channels in this study stem from the regulative pillar, directing behaviour through policies and rules, whereas most of the facilitators acted through the cultural-cognitive pillar, presuming behaviours through social narratives and cognitive frames. This was an

interesting finding, as it suggests that sustainable food can make sense through pathways other than policy or cost.

Overall, the theoretical framework served as a provisional heuristic, grounding the study's findings in prior research and established theory. Considering the five domains of CFIR and probing factors identified in prior research as barriers and facilitators supported thorough data collection, whereas the use of the three pillars of institutional Theory to explain how and why such factors were influential supported robust data analysis and interpretation. Further, the theoretical framework was used as a guide rather than force-fitting data into pre-existing understandings. Collected data from interviews and document analysis were leveraged to adapt the framework to align more effectively with the real-world implementation of sustainable food described by participants in this study.

6.4 Contributions

This study highlights the systemic nature of implementation in healthcare institutions. While a systems lens was applied by Wierda et al.,¹¹⁷ analysis of multiple sustainable food interventions across the broader food environment within healthcare institutions in Canada was missing from prior research. This thesis contributes to filling that gap, considering sustainable food that goes beyond climate impact to include pollution and waste, nutrition and disease risk, connections with local food producers, and cultural inclusivity, as well as the range of food options across the healthcare institution available to patients, staff, students, and visitors. The study builds on barriers and facilitators discussed in prior research by suggesting that influential factors act collectively to create feedback channels constraining or reinforcing change toward sustainable foodservice. Removing one barrier or implementing one facilitator is unlikely to be enough. Implementation must reflect the characteristics of a complex adaptive system wherein relationships between actors and elements are dynamic, and there are unpredictable effects of interventions dependent on the changing context.²¹⁷ The theoretical framework complemented the

systems lens by exploring factors across multiple interdependent domains while offering a rationale as to how and why factors were influential. I have highlighted where the framework could be improved, laying the foundation for future work exploring the processes underlying successful implementation in real-world contexts.

This thesis addresses calls within implementation science for more interpretive qualitative research that embraces complexity and reflects real-world practice.^{218,219} I have embraced the messiness of implementation within healthcare, rather than seeking to reduce it. I have grounded the study in a critical, interpretive research paradigm, not common in implementation research nor in prior studies about barriers and facilitators to sustainable food. I have situated my identity, as well as my axiology, within the study's design and results. My subjectivity offered valuable insights through my experience and empathetic lens. I have experienced the power of the therapeutic relationship between healthcare provider, patients and their families to improve health, and have for many years questioned why we wait until there is a serious illness to leverage that power instead of preventing ill health. My interpretation contributes an additional perspective on the implementation of sustainable food within healthcare, enriching this field of research. My hope is that this thesis and subsequent knowledge translation efforts inspire other researchers to acknowledge their assumptions and embrace the value of their subjective insights.

Canadian healthcare institutions have begun paying attention to the need for low-carbon, climate-resilient systems, yet the little available research suggests there is a need for more action.^{61,111,129,220} As one participant in this study suggested, there is discussion and planning, but the ability to move forward is limited. This thesis aims to support institutions in Ontario to move forward by highlighting lessons learned by the institutions and individuals who have experienced success. The most powerful channel for change is shifting social narratives and cognitive frames to make sense of sustainable food's role in quality patient care. Making sense occurs through change management

strategies, such as meaningful staff engagement, translating the holistic why for different individuals and roles, iterating interventions to fit the context, and embedding for long-term change. Making sense can develop from the bottom-up, leveraging external partnerships to compensate for missing resources. In sum, this thesis offers directions toward a theory of change to inform efforts to achieve sustainable foodservice in healthcare.

6.5 Thesis strengths and limitations

My critical research paradigm resonates with the perspectives of qualitative experts such as Braun, Clarke, Lincoln, and Guba^{201,221} related to quality in qualitative research. As identified in Chapter 5, reporting incorporated Braun and Clarke's Big Q Qualitative Reporting Guidelines,²⁰¹ where the guidelines were congruent with a critical research paradigm and case study methodology. For example, I used a reflexive writing style, assuming my active role in the study, over a neutral, third-person approach.²⁰¹ However, rather than titling the results section analysis, as recommended in the Big Q Reporting Guidelines, I opted to title that section results, respecting case study conventions.^{179,222} According to the perspectives of Lincoln and Guba,²²¹ this study has resonance. There is congruence across the research paradigm, including the philosophical assumptions, methodology, and methods.^{131,221} The presentation of results reflects the multiple perspectives of the participants, as well as the generation of knowledge between study data and myself as the researcher.²²¹ I developed an interdisciplinary theoretical framework merging systems science, implementation science, and social science to ground the study in prior knowledge and theory. I leveraged the theoretical framework to develop an initial interview guide, which was piloted with qualitative and subject matter experts, as well as a preliminary coding template. The interview guide and coding template were iteratively adapted based on study data, applying the theoretical framework as a provisional heuristic, rather than forcing-fitting data.²²¹ I also aimed to create a unified argument about the key themes throughout the results and discussion, and my philosophical assumptions were made explicit in a detailed chapter situating my

positionality, values, ontology, and epistemology within the study's design, methods, and interpretation.²²¹ Lastly, the interpretation aims to empower the reader by challenging usual practices in healthcare, common understandings of the concept of care and the role of healthcare institutions in society, and healthcare's ethical responsibilities, especially in high-income countries.²²¹

I initially planned to include six cases to explore a diversity of perspectives from across Ontario. However, the study scope precluded the representation of more than three institutions. Cases were purposefully chosen in consultation with knowledge users I have previously consulted with, potentially confirming my preconceived ideas about successful implementation. Recruitment for this study was challenging, requiring flexibility and adaptation. One of the healthcare institutions approached to participate declined due to competing demands and limited capacity. Recruitment at two of the institutions was half the targeted amount, necessitating pivoting from a true collective case study, which would gain an in-depth understanding of each case, to focus on one exemplar institution with comparative data from those two institutions. The interviews provided rich information, but an in-depth understanding of the comparative institutions' experiences implementing sustainable food interventions would require additional perspectives. I was not able to recruit participants from senior leadership, clinical care, or those who interact directly with patients. Nevertheless, interviews purposefully explored knowledge sharing with clinical care and how that relationship is conceptualized by foodservice staff. In the future, I would reflect more deeply on the recruitment of healthcare workers. Perhaps adding a less time-consuming data collection opportunity, such as a survey, would yield higher recruitment rates. Participants could complete a survey more quickly over multiple time points than a 60-minute interview, reducing the burden on their time and energy. A survey informed by prior interviews could be distributed to a larger sample to increase the perspectives represented. However, the depth of data and attention to context would be more limited. Engaging knowledge users from hospitals in the study design

and development of data collection tools could provide more incentives and opportunities to participate, while potentially resulting in more inclusive collection methods.

Concurrent data collection and analysis, as well as follow-up interviews, were valuable for interrogating the key barriers and facilitators reflected in field notes and preliminary coding, providing more opportunity to generate knowledge between the participants and myself as the researcher. Sequential interviews at the exemplar and then at the comparative institutions allowed iterative adaptation of the interview guide to focus on whether factors at the exemplar acted in a similar manner at the comparative institutions at different stages of sustainable food implementation. Nevertheless, focusing on one exemplar institution may have limited the exploration of factors affecting implementation. The findings of this thesis are not purported to be representative of other institutions in Ontario, but to offer another perspective to the existing research, potentially informing approaches to sustainable foodservice and the design of interventions.

Data were collected at one time point, not longitudinally. Experiences of the participants in this research may have evolved since data collection, including in response to taking part in the interviews. I was unable to collect the perspectives of those who originally implemented some of the sustainable food interventions at the exemplar institution. It would have been valuable to explore their motivation, challenges, and lessons learned.

6.6 Future research

To extend this work, it would be valuable to integrate experiences of other individuals in healthcare institutions, such as clinical staff and patients. Exploring how such individuals make sense of interventions related to sustainability, and the engagement and knowledge sharing strategies that would be most effective, would extend this thesis's findings and possibly provide insights into how to overcome ongoing barriers to change, such as patient preferences and framing by clinical staff. Follow-up studies

with the institutions in this study, or with institutions leveraging the results of this study to move forward with sustainable food implementation, would be beneficial for understanding how key processes evolve over time and in different contexts, and the impact on implementation. Collaborative design of data collection methods could compensate for low recruitment from healthcare institutions.

Testing and refining the theoretical framework in different contexts would be valuable to advance our understanding of the implementation of sustainable food and other sustainability transitions in healthcare institutions. The contributions of NPT to the theoretical framework could be explored in more depth, as well as other implementation theories, models, and frameworks. As mentioned, the expansion of sustainability into healthcare is an emerging field. It would be valuable to explore how prior implementation frameworks developed to advance human health could be amended to more effectively advance planetary health.

Outcome evaluations of sustainable food interventions using multidimensional planetary health criteria, such as emissions reductions, chronic disease management, procurement contracts with local food producers, and inclusivity, would be valuable for providing data to support changes to accreditation standards and help policymakers make sense of sustainable food.

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Appendix A – Initial Interview Guide

1. Introduction and consent

- Thank you for taking the time to meet with me today. My name is Lisa Blank. I am a master's student at the University of Waterloo. Before we get started with the interview, I'd like to review the consent form. Have you had a chance to read and sign it?
[If participant has not already signed consent form, read verbal consent form and document consent.] **Start recording.**
- I will take notes throughout the interview. I might paraphrase your thoughts to make sure I understand your perspective. Please correct me if I'm misinterpreting your perspectives, or if you'd like to clarify something, because I really want to understand your experience. You can choose not to answer any of the questions, and you can stop the interview at any time if you wish.

2. Warmup

- Can you tell me about your role at the hospital?
 - How long have you been in that role?
- Can you tell me what comes to mind when you hear the term sustainable food?
 - Prompt about social, economic, health, and environmental dimensions with examples
 - Is there a different term or descriptor you would use to describe this concept?
- How do you think sustainable food/other term is understood in the hospital?
 - Follow up: How has this understanding changed over time?

3. Role of sustainable food in hospital

- Do you think sustainable food/other term is reflected in the mission and values of the hospital? What about in the strategic goals of the hospital?
- Do you think the local community is engaged by the hospital? By foodservice? How would you characterize this engagement? Can you give an example?

4. For foodservice staff only

- Can you tell me about foodservice across the hospital?
 - Prompt about different locations, foodservice models at each location (ordering, prep, serving of food), menu planning at each location (priorities when menu planning, seasonality and cultural considerations incorporated)
 - What kind of training is offered in foodservice? Does it include sustainability?
- How is food & packaging waste handled?
 - Prompt about compost, recycling, on-site technology, landfill, cost
 - Is that process the same for all foodservice locations?
- How do you think foodservice is/is not sustainable?

- What do you think are the biggest barriers to making foodservice more sustainable?
- What do you think might support making foodservice more sustainable?

5. For leadership only

- How are the strategic goals of the hospital applied to specific programs, such as foodservice?
 - How are programs held accountable for achieving the strategic goals of the hospital? Are there formal reporting mechanisms?
 - How can staff from specific programs, such as foodservice, influence the strategic goals of the hospital? Are there formal mechanisms to contribute?
 - Are there strategic goals which are at odds with each other? Ex: local suppliers vs. financial stability. How are those dealt with?
- Are there dedicated roles for staff to address the sustainability within the hospital? Within foodservice?
 - If yes: How has having dedicated roles influenced the sustainable food projects and their implementation?
 - If no: Has that been discussed as an option? Why or why not?
- What do you think are the benefits for the hospital and patient care provided by foodservice?
 - Prompt about social, health, economic, and environmental dimensions.
 - Do you think those benefits could be strengthened through sustainable food projects?
 - Do you think the current benefits outweigh or balance out the costs the hospital incurs to operate foodservice? Would that balance change if sustainable food projects were increased?

6. For front-line care only

- What are your general impressions of the food served on the unit?
 - Follow up: Do you think foodservice encourages social, economic, health, and environmental sustainability? Why or why not?
- Can you tell me about how food waste is handled on the unit?
 - Follow up: Has this changed over time?
- Do you think food waste is an issue on your unit? Why or why not?
- Can you tell me about how patients react to the food served? Without compromising patient confidentiality, can you give me an example?
 - Have you noticed differences in how the food is received based on cultural differences? Are there groups who might not feel represented in the food served?
- How have changes to foodservice changed the workflow on your unit?
 - How do you think that influenced the success of the changes?

- What have you noticed about the reaction of patients to these changes? Without compromising patient confidentiality, can you give me an example?
- How do you think these projects have impacted the amount of food waste on your unit?
- How were changes communicated to your unit? Was there an opportunity to submit feedback to foodservice about the changes?

7. Current and past sustainable food projects

- Can you tell me about some of the sustainable food projects you are most familiar with that have been implemented?
 - Prompt with known projects (from student investigator's prior scoping review)
 - Prompt different areas of foodservice (e.g., in-patient, cafeteria, vending machines, etc.)
 - If none reported, move to section 10
- Can you tell me the story of how that project came to be implemented?
 - What was the motivation behind it?
 - Was the goal of the project at odds with other hospital goals?
 - Who were the stakeholders/key players involved?
 - Prompt about internal and external
 - How much collaboration was there between foodservice and other parts of the hospital?
 - Was leadership involved? How? Is formal reporting to leadership about the project required? Ex: incorporated into key performance indicators (KPIs)?
 - How much was understood about the elements of this project beforehand?
 - How confident were those involved that this could be achieved at the beginning?
 - Did the project need to shift gears based on new knowledge?
 - What resources were used?
 - What resources were lacking?
 - What kind of training was needed?
 - How were changes communicated across the hospital?
 - Was the community (patients, families, food producers, community representatives) engaged in the discussion, planning, or implementation?
 - Has the project been evaluated to understand its impact? What was done with the results? Was the community engaged in the evaluation?

8. Factors influencing implementation

- Facilitators
 - Were there particular things that made implementation easier?
 - Follow up on factors already mentioned, such as

- How were stakeholders/key players helpful? What did they provide that was most beneficial?
- Were there particular people who were most helpful? What were their roles? What kind of leadership was shown?
- How did communication make implementation easier? How were particular communication channels useful?
- How did training make implementation easier?
- How did community engagement contribute?
- Barriers
 - Were there particular things that made implementation more challenging? What contributed to that challenge? How was the challenge resolved?
 - Follow up on factors already mentioned, such as
 - How did stakeholders/key players make implementation more challenging?
 - How did leadership involvement make implementation more challenging?
 - How did communication make implementation more challenging?
 - How did a lack of knowledge make implementation more challenging?
 - Were there relevant training resources available or challenges to implementing training?
 - How did community engagement (or lack thereof) influence the project?

9. Facilitators and/or barriers to past/future sustainable food projects

- How has the original project changed over time? What contributed to those changes? What has been helpful to keep it successful? Have findings from an evaluation been incorporated?
- Has the project contributed to policy changes within the hospital?
- Are there parts of the project or other projects that did not succeed? What contributed to that? What would have helped it succeed?
- If you were to give advice to other hospitals looking to implement sustainable food projects, what would you say would be key factors in their success? What key challenges would be faced? What might be needed to overcome those challenges?
 - How might current events, such as US tariffs, influence the project?

10. If sustainable food projects were not reported (skip if projects were reported)

- How do you think foodservice could be changed to incorporate the sustainability goals of the hospital?
- What do you think are the key challenges to sustainable food projects at the hospital?
- What do you think might help support sustainable food projects at the hospital?

- Are you aware of a green team or sustainability committee in the hospital? If yes, why do you think it has not focused on foodservice? If no, how do you think that might influence sustainable food projects?
- Are you aware of anyone who has tried to advocate for sustainable food projects? If yes, why do you think they have been unsuccessful?
- Has the hospital done a waste audit? If yes, how have the results been used?
- Follow up on prior answers, including foodservice role in supporting mission and values of hospital, understanding of sustainable food in hospital, etc.

11. Food options for staff/visitors

- Can you tell me about the food options for hospital staff and visitors?
 - How do you think those options align with sustainable food?
 - How do you think those options align with the mission and values of the hospital?
 - Do you think staff or visitors are satisfied with those options? Why or why not? Do you think the options are culturally inclusive?
 - Can you think of any challenges that would arise/that did arise while trying to make those options more sustainable?
 - Can you think of things that would support/that did support making those options more sustainable?

12. Demographics

Rationale for collecting this data - prior research has reported that factors such as age, gender, and ethnicity have acted as either barriers or facilitators to sustainable and/or sustainable food projects in healthcare. Further, “failing to measure (social constructs that may serve as identifiers) serves to support and protect existing hierarchies, hides differences and exempts people from engaging in discourse around (discrimination).” (CIHI, 2022)

- Where does your age fall within the following ranges?
 - < 30
 - 30-50
 - 51-75
 - 75+
- Which of these gender categories do you identify with? (CIHI, 2018)
 - Female gender
 - Male gender
 - Gender diverse
 - Another option not specified
- People are often described by their race or racial background. These are not based in science, but our race may influence the way we are treated by individuals and institutions. Which category(ies) best describes you? (CIHI, 2022)
 - Black (African, African Canadian, Afro-Caribbean)

- East Asian (Chinese, Japanese, Korean, Taiwanese)
- Indigenous (First Nations, Inuk/Inuit, Metis)
- Latin American (Hispanic, Latin American)
- Middle Eastern (Arab, Persian, West Asian – Afghan, Egyptian, Iranian, Lebanese, Turkish, Kurdish)
- South Asian (Bangladeshi, Indian, Indo-Caribbean, Pakistani, Sri Lankan)
- Southeast Asian (Cambodian, Filipino, Indonesian, Thai, Vietnamese)
- White (European descent)
- Another option not specified
- What is your highest educational attainment? (CIHI, 2018)
 - Less than high school
 - High school completion
 - Post-secondary completion below a bachelor's degree
 - Bachelor's degree completion
 - Post-secondary completion above a bachelor's degree
- What is your profession?

13. Wrap up

- Is there anything else you would like to add?
- Thank you again for taking the time to meet with me.

Turn off recording

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Canadian Institute for Health Information, (2018). In Pursuit of Health Equity: Defining Stratifiers for Measuring Health Inequality. A Focus on Age, Sex, Gender, Income, Education and Geographic Location. Ottawa: ON: CIHI.

Canadian Institute for Health Information, (2022). [Guidance on the Use of Standards for Race-Based and Indigenous Identity Data Collection and Health Reporting in Canada](#). Ottawa: ON: CIHI.

Appendix B – Information Letter

Study title: Barriers and facilitators to sustainable food initiatives in healthcare institutions in Ontario, Canada

Principal investigator (or faculty supervisor): Dr. Sharon I. Kirkpatrick, School of Public Health Sciences, 519-888-4567, ext. 47054, sharon.kirkpatrick@uwaterloo.ca

Student investigator: Lisa Blank, School of Public Health Sciences, lblank@uwaterloo.ca

You are invited to participate in a study about sustainable food projects within healthcare institutions in Ontario, Canada. Sustainable food is considered to be protective and respectful of the environment, culturally acceptable, accessible, economically fair and affordable, nutritionally adequate, safe and healthy. This study is being conducted as part of a master's thesis under the supervision of Dr. Sharon Kirkpatrick.

To help you make an informed decision regarding your participation, this letter explains what the study is about, what participation involves, possible benefits and risks, and your rights as a research participant. You may print/save a copy of this letter for your records. If you do not understand something in the letter, please ask one of the investigators before consenting to participate.

What does this study involve?

The study will involve interviews with up to 15 participants from 3 participating hospitals across Ontario. Those eligible to participate include individuals currently working in any role in one of these hospitals who have knowledge of the hospital's foodservice programs, including planning, production, distribution, waste management, and/or evaluation. Interviews will focus on experiences and perspectives related to sustainable food projects and the factors that supported and limited them.

Participation

Participation in the study involves one virtual interview, approximately 45–60 minutes in length, to take place between January and March 2026.

The interview will be conducted using the online platform, Microsoft Teams. Microsoft Teams has implemented technical, administrative, and physical safeguards to protect the information provided via the Services from loss, misuse, and unauthorized access, disclosure, alteration, or destruction. However, no Internet transmission is ever fully secure or error-free.

With your permission, the interview will be audio and video recorded to facilitate the collection of information. The interview will then be transcribed for analysis, and both the audio and video recordings will be destroyed.

You will be asked for information about your role at the hospital and how long you have been in that role to tailor the interview questions to your experience. You will also be asked about your age, gender identity, racial identity, and highest level of education to help understand whether experiences related to foodservice and sustainable food projects differ by these characteristics. This information will be

combined with that of other participants to help understand whether experiences related to foodservice differ by these characteristics. This information may be used to broadly describe the characteristics of participants (e.g., average age, average education).

Your rights as a research participant

Your participation in this study is voluntary. You may decline to answer any of the interview questions if you so wish. Further, you may decide to withdraw from this study at any time without any negative consequences by advising the investigator. If you wish to withdraw your study data after participating, you can request your data be removed up until the end of April 2026. After the end of April 2026, identifying information will be removed from your data, and it will not be possible for the investigators to identify and remove your data.

All data will be securely stored on a password-protected University of Waterloo server. Only members of the research team will have access to your information. Your identity will be kept confidential by anonymizing your data (assigning a unique identifier to your data). Quotations without identifying information may be used in thesis documents, reports, papers, and presentations, and may be attributed to your area of expertise (e.g., as a dietitian). The data will be retained for at least 5 years.

Benefits and risks associated with participation in the study

Participation may not provide any direct personal benefit to you. The research will be used to help identify where to focus future efforts, the resources needed, and strategies to promote sustainable food, health, and equity, with societal benefits.

There are no known or anticipated risks to you as a participant in this study. It is possible that information shared in interviews about your involvement in sustainable food projects within the hospital could be attributed to you by others in the hospital. It is also possible that, through descriptions of specific projects, the hospital could be identified by those familiar with the hospital, the project, or sustainable food projects in general. Identifiable information, which could include descriptions of the hospital or dates/sources of media attention, will be removed as much as possible from quotations and excerpts used in thesis documents, reports, papers, and presentations to keep your identity and that of the hospital confidential.

Reuse of data

Your anonymized data may be used in future research to advance sustainable health systems in Canada by the student investigator as part of their future PhD degree. In all future research, your data will remain anonymized to keep your identity confidential. Your data will be stored in a database on a password-protected University of Waterloo server. The student's supervisor, Professor Sharon Kirkpatrick, will be the custodian of the database. The student investigator and their supervisor will be the only individuals with access to your data. Once you have voluntarily given broad consent for the reuse of your data in future research projects, you will not be recontacted about the reuse of your data.

Contact information

This study has been reviewed and received ethics clearance through the University of Waterloo Research Ethics Board (REB 47909). If you have questions for the Board, you may contact the Office of Research Ethics (toll-free 1-833-643-2379 (Canada and USA), 1-519-888-4440, or reb@uwaterloo.ca).

For all other questions or if you would like additional information to assist you in reaching a decision about participation, please contact me by email at lblank@uwaterloo.ca. You can also contact my supervisor, Professor Sharon Kirkpatrick, at 519-888-4567, ext. 47054, or email sharon.kirkpatrick@uwaterloo.ca.

Appendix C – Written Consent Form

Study Title: Barriers and facilitators to sustainable food in healthcare institutions in Ontario, Canada

By providing your consent, you are not waiving your legal rights or releasing the investigator(s) or involved institution(s) from their legal and professional responsibilities.

I have read the information presented in the information letter about the study being conducted by Dr. Sharon Kirkpatrick and Lisa Blank from the School of Public Health Sciences at the University of Waterloo. I have had the opportunity to ask any questions related to this study and to receive satisfactory answers to my questions and any additional details I wanted.

I am aware that participation involves one 45-60-minute interview and that my interview will be audio and video recorded to ensure an accurate recording of my responses.

I am aware that sections from the interview may be included in the thesis documents, reports, papers, and presentations based on this research, with the understanding that the quotations will be anonymous and may be attributed to my area of expertise (e.g., as a dietitian).

I was informed that I may withdraw my consent without penalty by advising the researcher before the end of April 2026. After the end of April 2026, it will not be possible for the investigators to identify and remove my data.

This study has been reviewed and received ethics clearance through a University of Waterloo Research Ethics Board (REB 47909). If you have questions for the Board, you may contact the Office of Research Ethics (toll-free 1-833-643-2379 (Canada and USA), 1-519-888-4440, or reb@uwaterloo.ca).

For all other questions, please contact Lisa Blank at lblank@uwaterloo.ca

☐ YES ☐ NO I agree, of my own free will, to participate in this study.

☐ YES ☐ NO I agree to have my interview audio and video recorded.

☐ YES ☐ NO I agree to the use of quotations in any thesis, paper, publication, or presentation that comes from this research, with the understanding that quotations will be anonymous and may be attributed to my area of expertise (e.g., as a dietitian).

Participant Name: _____ (Please print)

Participant Signature: _____

Date: _____

I broadly consent for my study data to be retained for future research, with the understanding that it will be securely stored and accessed only by the student and principal investigators. I understand I will not be recontacted about the reuse of my data in future research projects.

☐ YES ☐ NO I consent to allowing my study data to be used for future purposes as described in the information letter.

Participant Name: _____ (Please print)

Participant Signature: _____

Date: _____

Appendix D – Verbal Consent Form

Have you had a chance to read the information letter? Do you have any questions?

By providing your consent, you are not waiving your legal rights or releasing the investigator(s) or involved institution(s) from their legal and professional responsibilities.

As a reminder, participation in this interview is voluntary, and you may end the interview session by advising me of your decision at any time. You may withdraw your consent up until the end of April 2026. After April 2026, it will not be possible to remove your data. If you have questions for the Research Ethics Board, contact information for the Office of Research Ethics is listed on the information letter that you received prior to this session. For all other questions about the study, you may contact me at lblank@uwaterloo.ca.

Do you consent to participating in the interview?

☐ YES ☐ NO

Do you give permission for your interview to be audio- and video-recorded?

☐ YES ☐ NO

Do you agree to the use of anonymous quotations in any thesis documents, reports, papers, and presentations resulting from this research, with the understanding that you may be referenced generally by your area of expertise (e.g., as a dietitian)?

☐ YES ☐ NO

Do you agree to your study data being retained for a minimum of 5 years for use in future research, with the understanding that it will be securely stored and accessed only by the research team, and that you will not be recontacted about the reuse of your data in future research projects?

☐ YES ☐ NO

Participant's name: _____

Researcher's signature: _____

Date: _____

Appendix E – Field Note Template

Before

Date:
Time:
Participant ID:
My knowledge of their role:
Current events:
Weather:
Other:

During

Participant location:
Quality of connection:
Demeanor:
Non-verbal cues:
Keywords to follow up on:
Questions that don't land:
Questions that got a good response:
Other:

After

Sustainable food terms:
Key facilitators:
Key barriers:
Most important points I learned from this person:
How did my positionality have an influence:
What I did well:

What I did not do well:
Questions that could be changed:
Things to follow up on in subsequent interviews:
Length of interview:
Technical challenges:
General reflections:

After preliminary coding

Things I should have probed more deeply:

Things to follow up on in subsequent interviews:

Appendix F – Appreciation Letter

Subject Line: Thank you – University of Waterloo sustainable foods study

[Insert Date]

[Insert Name]

Thank you for your participation in the study entitled “Barriers and facilitators to sustainable food in healthcare institutions in Ontario, Canada.” The purpose of this study is to explore factors supporting and hindering sustainable food projects within hospitals in Ontario. The data collected will contribute to a better understanding of strategies to promote planetary and human health and equity within healthcare.

Your identity will be kept confidential. Results are anticipated to be available by September 2026, and I will share the findings through reports, journal articles, webinars, and conference presentations. If you are interested in receiving information about the results of this study, please reply to this message.

This study has been reviewed and received ethics clearance through a University of Waterloo Research Ethics Board (REB 47909). If you have questions for the Board, you may contact the Office of Research Ethics (toll-free 1-833-643-2379 (Canada and USA), 1-519-888-4440, or reb@uwaterloo.ca). For all other questions or comments, please contact me at lblank@uwaterloo.ca.

Thank you again.

Lisa Blank RPN BPH
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